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THE CHEMISTRY OF THE HOOF OF THE HORSE.

BY FRED SMITH, M.R.C.V.S., PROFESSOR ARMY VETERINARY SCHOOL, ALDERSHOT.

THIS is not the first time that an attempt has been made to analyse the horse's hoof.* I have gone over some old ground for personal satisfaction, and have added something new respecting the evaporation from horn and the power which the wall possesses of absorbing certain fluids.

A perfectly healthy and fresh foot was submitted to analysis (the operation was repeated twice to ensure accuracy); it gave the following composition :—

ANALYSIS OF HORN.

	Wall.	
Water	20·00	19·87
Organic matter	79·55	79·66
Salts	·45	·47
	100·00	100·00

* In an article published in the *Veterinarian* for May, 1871, on "The Anatomy and Physiology of the Horse's Foot," the following analysis made by Professor Clement, of Alfort, is quoted by the author, Mr. (now Dr.) George Fleming.

	Wall.	*Sole.*	*Frog.*
Water	16·12	36·00	42·00
Fatty matter	·95	·25	·50
Matter soluble in water	1·04	1·50	1·50
Insoluble salts	·26	·25	·22
Animal matter	81·63	62·00	55·78
	100·00	100·00	100·00

Sole.		
Water	34·77	29·62
Organic matter	64·92	70·04
Salts	·31	·34
	100·00	100·00
Frog.		
Water	45·27	35·12
Organic matter	54·13	64·27
Salts	·60	·61
	100·00	100·00

As we might expect, the largest amount of water is found in the frog, and the least in the wall. There is a very singular feature with regard to the water.

Those engaged in carrying out delicate chemical investigation know well how exceedingly difficult it is to weigh substances accurately, so as to get their exact weight either before or after drying, the explanation being that most substances absorb water so readily that the moisture in the air of the laboratory, or the case of the balance, is greedily seized upon by them, and the weight alters at once; they become, in fact, very much heavier, and results calculated from this would be most misleading, unless the operation be repeated several times to ensure accuracy. Now, strange to say, with hoof the matter is quite reversed; instead of gaining weight while being weighed *it loses it*, and so rapidly that every second or so *it is lighter* than it was before. In other words, the evaporation from horn is exceedingly rapid, surprisingly so, and to obtain correct results perfectly fresh horn must be used and the weight ascertained in a few seconds. This explanation will account for the slight differences observable between my two analyses.

By a simple experiment it is easy to ascertain at what rate the moisture from horn evaporates. I took two pieces of the wall, A and B, and weighed them carefully. They were then put aside; twenty-four hours afterwards they were weighed again; A had lost 2·452 per cent. of its weight, and B had lost 1·92 per cent. In five days from the first weighing A had lost 4·71 per cent., and B 4·36 per cent. of its original weight. This is an enormous decrease in weight for such a short time. Practically we recognise this rapid evaporation from horn; we see it in dry brittle feet, and we see it in those hoofs we try to keep as specimens, which we know rapidly shrink from loss of water and became very dry and brittle.

But this fact has its practical aspect, for we can easily imagine the evaporation which occurs from a wall that has been rasped and the fibres torn across, and clinically we recognise that this highly objectionable practice is a common cause of brittle feet.

If perfectly fresh horn be placed in a bottle fitted with an air-tight stopper we then find that it loses but little moisture, and that which is evaporated condenses on the sides of the bottle in the form of beads; if the horn is left long in this condition it becomes covered with a fungus. This is particularly noticeable with the frog.

It will be observed that the amount of water in my two analyses do not quite agree with each other, nor with that made by Professor Clement; this is explained by the extreme difficulty experienced in preventing evaporation during weighing.

The organic matter in horn is large; it is largest in the wall and least in the frog. This organic matter is extremely difficult to destroy by fire, it takes several hours of intense heat to get rid of it; on heat being first applied the horn swells and liquefies, bubbles of gas break through the swollen liquid surface, and then come out in streams. This gas is inflammable and burns with a peach-coloured flame, I therefore regard it as cyanogen; it is surprising the large amount of this gas which a small amount of horn will give off, and I have wondered whether this could be turned to any economic advantage?

The organic matter of horn is principally made up of a substance known to chemists as Keratin; it is a body possessing an inconstant composition, and is therefore considered likely to be a mixture of several substances; it is converted by the action of dilute sulphuric acid, among other bodies, into leucine and tyrosine, and is therefore an albuminous substance allied closely, perhaps, to elasticin. Considering the elastic nature of the horse's foot this appears most likely; in fact, at one time I was inclined to regard the foot as consisting of elasticin and not keratin, but elasticin yields no tyrosine, whereas this latter substance is readily obtained from horn. Keratin contains a large amount of sulphur; the fetor from thrush and canker is thus accounted for, the sulphur uniting with hydrogen, and forming sulphuretted hydrogen.

Horn boiled in hydrochloric acid turns the acid of a violet colour, and is partly dissolved; boiled with caustic potash, it is gelatinised; boiled with water or acetic acid, it is not affected; boiled with nitric acid it is dissolved, and the acid turned of a yellow colour; boiled with strong sulphuric acid it appears for a minute or so unaffected, when suddenly a hissing sound is heard, and dense white fumes of probably a mixture of gases are given off in *torrents;* the fumes smell of sulphur, chlorine, and phosphorus,

producing a powerful odour of burned rags. The fumes condense in the vessel in which the experiment is made, and the white gas is so heavy that it may be readily caught into a vessel placed below the delivery tube. The liquid left behind is of a deep brown colour.

If a salt of lead be added to an alkaline solution of horn the mixture is shortly turned a deep brown, from the presence of sulphur. A solution of potassium ferrocyanide, added to an acid solution of horn and boiled, causes an opaque blue precipitate to be thrown down.

I am quite unable to say what the burned-rag fumes are which are given off in such abundance with boiling sulphuric acid. Not having a gas apparatus I could not submit them to analysis.

The amount of fatty substance found by Professor Clement in the wall of the foot was ·26 per cent., by extracting the wall with ether I obtained 4·102 per cent.

The crystals formed from the organic matter in horn are those of leucine and tyrosine. I have found a considerable quantity of the latter but little of the former; I have also obtained a quantity of crystals resembling cholestrine.

The inorganic matter or salts of the foot are largest in the frog and least in the sole; these salts are very difficult to obtain, owing to the intense heat required to destroy the organic matter.

Wall.—Percentage of ash, ·45 per cent.
Ash soluble in water, ·08 „ „
Ash soluble in acid, ·11 „ „
Ash insoluble (silica), ·26 „ „

Sole.—Percentage of ash, ·31 „ „
Soluble in water, ·22 „ „
Soluble in acid, *nil.*
Insoluble ash (silica), ·09 per cent.

Frog.—Percentage of ash, ·60 „ „
Soluble in water, ·19 „ „
Soluble in acid, ·14 „ „
Insoluble ash (silica), ·27 „ „

With the exception of the sole, my insoluble ash agrees very closely with that found by Clement.

In the watery solution of ash there are traces of chlorides, lime is present, sulphates very largely, and phosphoric acid is present. In the acid solution of ash, sulphates and phosphates are again present, whilst iron is comparatively large.

It was observed that, no matter what heat was employed, it was impossible to make the ash white; it remained of a faint pink colour, which was probably due to the iron it contained.

I have always been much opposed to the use of greasy applications to the feet, believing them to be useless for the purpose for which they are intended. I was anxious to see, therefore, what power horn possessed of absorbing oil and water; for this purpose two pieces of perfectly fresh wall (A and B) were carefully weighed. The one was placed in water, the other in castor oil. After soaking in their respective fluids for twenty-six days, they were removed and weighed.

A, which had been placed in water, had the horn pliable and elastic; the coronary band was white, swollen, and pulpy, just as it appears after poulticing the foot. The horn looked perfectly fresh, just as if drawn from the foot; the gain in weight was 20·36 per cent.

B, which had been placed in castor-oil, was hard, harsh, entirely devoid of elasticity, and the coronary band and laminæ were shrivelled up, just as we see in a dried foot; the increase in weight was only ·234 per cent.

From this experiment we see that water will readily penetrate into the horny fibres of the foot, whilst oil has no such effect.

I repeated the above experiments with water, lanolin, and oil, leaving the wall in contact with these substances for ninety-eight days.

Horn which had been soaked in water gained in this time 18·9 per cent. in weight; that which had been soaked in lanolin gained 8·5 per cent.; and that in oil (olive) 2·2 per cent.

It is quite evident, therefore, that greasy applications to the feet for the purpose of making the horn elastic are utterly useless. Even after the long period of ninety-eight days, but a very small quantity had penetrated the wall. Lanolin, which is prepared from the natural fat in the wool of sheep, gave better results, though nearly 10½ per cent. less than water.

It can be easily understood, from what has been said, that horn will part with its water as readily as it takes it up; in eleven days a portion of wall had lost 23 per cent. of its weight; another portion of wall, which had been soaked in lanolin, lost in eleven days 1·4 per cent.; and a third, which had been in olive oil, only lost ·2 per cent. of its weight in the same time. The rational method of increasing the elasticity of feet would be to stand the horse in clay or apply moisture in some other way, and then retain this moisture in the fibres by covering the wall with oil to prevent evaporation.

INFECTIOUS GANGRENOUS MAMMITIS IN SHEEP.

READERS of the VETERINARY JOURNAL may remember that, some time ago, we gave the description of a contagious form of Mammitis in the cow, which had been investigated by M. Nocard, Professor of Surgical Pathology and Clinic at the Alfort Veterinary School. In that disease, which was essentially of a chronic nature, the lesion always remained localised in the udder, and did not appear to have any influence on the general health of the cow.

At a recent meeting of the Société Centrale de Médecine Vétérinaire, the same talented pathologist drew attention to another form of Mammitis which attacks ewes in milk, and, assuming a gangrenous character, so rapidly runs its course that death ensues in twenty-four, thirty-six, or forty-eight hours. It was only in 1885 that Nocard heard of it for the first time, when pursuing his investigations into the causes of abortion among the Nivernaise breed of cattle, the report of which we have also presented to our readers. At that time he was accompanied by a local veterinary surgeon, M. Farine, who alluded to this ovine Mammitis, known to the shepherds and farmers as "araignée," or "mal de pis," and which the veterinary surgeons were completely helpless to cure.

On his return to Alfort he looked up the literature of the subject, but found only slight reference to it. Hurtrel d'Arboval, in the 1823 edition of his work, says that, "in the ewe engorgement of the udder is generally known and described by the name of *mal de pis*, or more commonly that of *araignée*, because it is erroneously believed to be caused by the sting of an insect having that name. . . . It is an acute inflammation of the udder, capable of passing into a gangrenous state; it is not known why this troublesome termination should be more frequent in sheep than other animals." Gasparin merely mentions it, Beugnot simply reproduces d'Arboval's description, Benion does the same, but designates the disease *gangrenous erysipelas*. Zundel, in his edition of d'Arboval, speaks of gangrene as one of the possible terminations of Mammitis, but he says nothing of this particular Mammitis of ewes.

Some months subsequently (January, 1886), a letter was received from a veterinary surgeon, asking advice with regard to a similar disease prevailing among the milch ewes kept for the fabrication of Roquefort cheese. "In nearly all the flocks," he wrote, "and during the milking season, every year, there are more or less considerable losses from a kind of very intense Mammitis, which runs on rapidly to gangrene. A large proportion of those attacked succumb, and those which recover are invariably lost, so far as the production of milk is concerned.

This malady is justly considered the scourge of the cheese-producing flocks; for it is not rare to see one-tenth of their number attacked by the terrible disease. Every kind of treatment has been tried with equal non-success, and that which the shepherds find most useful in order to save the animal is to slit up the teat in different directions at the very commencement of the attack, and dress the wounds with some simple lotion. What is the nature of this malady? The majority of the veterinary surgeons of the country look upon it as a simple Mammitis caused by engorgement of milk, and blows inflicted by the milkers; but the owners refuse to believe in these pretended causes of the disease, and the majority consider it as of an anthracoid nature. This opinion, however, should be rejected, as the animals do not exhibit, either during life or after death, the symptoms or lesions of Anthrax, neither does an examination of the blood lead to the detection of bacteria. But might not this malady, nevertheless, be of a microbian nature, like that you studied with M. Mollereau? . . . . If you think it would be useful, I can send you either udders in different stages of the disease, or an affected animal, living or dead."

The malady above described seemed to be that which M. Farine had mentioned, and the same as that described by Hurtrel d'Arboval. Never having seen it, however, and being ignorant of its nature, Nocard requested that a ewe should be sent to him, alive if possible. So the matter rested until March 15th, 1886, when a milch ewe was brought to Nocard from the farm of Vincennes, and which had been ill since the previous evening. The creature was dull and depressed, but remained standing. The head was pendant and the eyes fixed; the respiration hurried, shallow, and trembling; the pulse small, the artery being hard and tense; the temperature was slightly elevated—39 6° Cent. The right udder appeared to be treble its usual volume; it was hard, tense, hot, painful on pressure, and had a reddish-violet colour, which extended outwards to the inner aspect of the thigh, behind to the vulva, in front on the abdomen, and within to the left mamma. The coloration of the skin was nearly uniform, except towards the teat, where it was deeper, and the teat, itself cold, appeared withered and limp, as if mortified. The limits of the diseased part were well defined by their deep tint, compared with the white skin around them, as if there were a patch of erysipelas.

The left udder appeared to be healthy, from its volume, temperature, and the suppleness of its tissue; and while it yielded on pressure perfectly normal milk, that from the right one gave a reddish, somewhat opalescent fluid, without clots or odour, but having a markedly acid reaction.

On the 16th the general condition was more aggravated. The ewe was lying, and neither ruminated nor ate; when raised, it could scarcely stand; the temperature was 39.5°. The gangrenous engorgement had invaded all the left mamma, which had now the same aspect as the right. The redness extended from the umbilicus to the inner and lower part of the thighs, and to the vulva and anus; it had the same characters as on the previous evening with regard to its purple and violet tints and its sharply-defined periphery, but these were now accompanied by great œdematous infiltration of the subcutaneous connective tissue and skin. When the swelling was punctured, a large quantity of reddish serum escaped. The two glands were cold, and appeared to be completely mortified; when the teats were pressed, a few drops of opaque red fluid, quite unlike milk, escaped from them.

On the 17th, the ewe was stretched out on the litter, incapable of movement; temperature 36·2°; ears cold. The mammæ were entirely gangrenous, being black and cold, and exhaling a putrid odour; while the subcutaneous infiltration had made more progress, and extended as far as the sternum. The animal died in the evening.

Autopsy. Considerable infiltration of the dermis and subcutaneous connective tissue of the entire inferior region of the trunk, perineum, and lower part of the thighs, the fluid having a markedly reddish tint, but destitute of odour. The two mammæ, treble their normal size, on section had a violet tint, due to the infiltration of their connective elements with serum; the lobules of the gland were isolated, as if by a veritable hydrotomic dissection. The peritoneal cavity contained a small quantity of reddish serum. The whole of the vascular network of the intestine and mesentery appeared as a rich, dark-coloured arborisation, seemingly due to intense congestion; the mucous membrane was normal. The spleen was small, shrivelled, and black, and its tissue somewhat friable. The lungs were voluminous and engorged with blood, but there was no appreciable lesion. The cavities of the heart and all the large vessels contained black and very firm clots.

At first sight it seemed that this ewe offered a typical example of the disease Hurtrel d'Arboval had described as *araignée*. There was, in fact, a gangrenous inflammation of the udder with the progressive tendency noticed by all observers.

Nocard lost no time in studying the case which chance had furnished him with. From the first day he had examined the blood and milk obtained from the two glands. These fluids from the left (healthy) gland showed nothing abnormal; spread on glass in thin layers, and dried, stained, and mounted according to the classical

procedure, they offered no traces of foreign elements; sown in appropriate media, they were uncultivable. Not so with the reddish fluid extracted from the diseased (right) gland. This exhibited a prodigious quantity of an extremely small micrococcus, either singly or associated in zooglea, as if cultivated in a state of purity. The œdema serosity was equally rich in micrococci. Sown in fowl or veal broth, this diseased milk and serum, in less than twenty-four hours, gave an abundant pure culture of a micrococcus similar to that already described.

Injected into the milk ducts of a healthy ewe, five drops as a dose, the diseased milk produced the malady in all its features. Next day the gland was swollen, tense, red, and painful, though the temperature was only 39·2°. In the evening (twenty-four hours after the injection) the redness had invaded the other gland, the perineum, and the inner aspect of the thighs; temperature, 39·1°. On the second day, the animal was extended on the litter, unable to rise, and refusing all food; temperature, 38·6°. The ears were cold, the tumefaction more extensive, redness deeper, and the œdema more intense; the mammæ were cold and mortified, the teats being flaccid and shrivelled. The ewe died forty-two hours after the inoculation, and the autopsy showed the same lesions as in the preceding case—especially the intense injection of the intestinal vessels, the smallness and friability of the spleen, and the volume and density of the clots in the heart and large vessels. From the first day the milk was red and acid, while on microscopical examination considerable quantities of micrococci, like those already mentioned, and in a state of purity, were observed. Inoculation had, therefore, exactly reproduced the malady.

On March 20th, at nine o'clock in the morning, a second ewe was inoculated, by injecting into the substance of the right mamma five drops of the fifth cultivation of the micrococcus in neutralised veal broth. In the evening the gland was the seat of gangrenous engorgement identical with that already described; temperature, 39·4°. The animal died next day at half-past two in a state of collapse.

The œdema and violet coloration occupied the entire inferior surface of the trunk, inner face of the thighs, perineum, and around the anus and vulva. The right mamma yielded on pressure a reddish opaque fluid, while the milk from the left was of a faint rose tint. These two fluids contained the same kind of micrococcus as had been previously discovered, and their cultivation was equally pure and abundant. There was the same intestinal injection of vessels, and the same firm clots in the large vessels.

At ten o'clock on March 21st, a three months' old lamb was

inoculated by hypodermic injection, with four drops of the sixth cultivation. It was found dead at six o'clock next morning. Enormous reddish œdema of the whole lower surface of the body, with lesions and microscopical appearances as before.

These experiments certainly prove that the Mammitis to which the ewe from the Vincennes farm had succumbed, was caused by the micrococcus observed in the milk and œdema of the diseased organ. But was the malady really that known as *araignée?* This case was the only one which had been seen at Vincennes for more than ten years, but where *araignée* prevailed isolated cases were never witnessed. Nocard, therefore, determined to study a non-doubtful case of the *mal de pis*, more especially with regard to the biological history of the pathogenic micrococcus he had isolated.

The opportunity soon occurred. On April 26th, M. Revel, finding a ewe affected with the *mal de pis*, collected a small quantity of the already altered milk from the diseased gland, and on the same day he injected twenty drops in each mamma of an old, but healthy ewe, which he bought for the experiment. This animal he sent off express at once to Nocard. This mode of procedure appeared to be preferable to any other, as there was almost a certainty of receiving the creature alive, and in good condition for study. It arrived on the evening of the 27th, and appeared to be extremely ill; lying at the bottom of the box, it refused to get up, and when lifted on its feet it fell heavily on the litter without attempting to make a movement. It did not evidently see the food placed before it, and drank only a few drops of water. The two mammæ were considerably swollen, hot, tense, painful, of an intense purple colour, bordering sharply on the white skin around. The supernumerary mammæ were also involved in the lesion. The teats were cold and shrivelled, and dark in colour. Pressure on the gland caused the escape of a reddish, opaque, but non-grumous fluid, having no resemblance to milk.

Examined after staining, this fluid was crowded with the small micrococci Nocard had already found in that from the ewe belonging to the Vincennes flock. Sown in different solid and liquid media, it yielded cultures absolutely identical with those he had already obtained. Lastly, inoculated beneath the skin of a healthy sheep, it killed it in thirty-eight hours, the same symptoms and lesions being noted as in the other cases.

There could be no doubt, then, that the disease Nocard had studied was the *araignée* of d'Arboval, and that it prevailed among the milch ewes of Larzac as the *mal de pis*.

Nocard's observations with regard to the biology of the pathogenic microbe of this form of ovine Mammitis are of much

interest. This is one of the smallest micrococci he has yet seen, it being much less in size than each of the two grains which seem to form the microbe of Fowl-cholera. Very abundant in the milk and serum of the œdema, Nocard could not find it in the blood, the splenic pulp, or any other parenchyma. In the milk from the diseased ewes, as in the serum from the œdema, and as in the different solid or liquid cultivation media, there are micrococci isolated, associated in fours, or agglomerated in zooglea more or less voluminous; they never assume the form of chains or chapelets.

The cultivation of this micrococcus is very easy; all the known media seem to be adapted for it, provided they are neutral or alkaline. In the different broths it multiplies with prodigious rapidity; in less than twenty-four hours the fluid is turbid and almost lactescent; after forty-eight hours the bottom of the vessel is covered with a thick, white, powdery-looking layer, resulting from the accumulation of an infinite number of micrococci; and from the first day the broth, which was neutral or alkaline at the moment of sowing, becomes freely acid, though less so, nevertheless, than when it is sown with the streptococcus of the bovine Mammitis.

If care be taken to make a fresh cultivation every day, by taking as seed a drop of that of the previous day, the microbe retains almost intact its power of growth, as well as its virulence; but if the cultivation be left in the incubator without being renewed, it soon ceases to grow, and the micrococcus loses its property of reproduction. With it, as with the bovine Mammitis streptococcus, it seems as if the acidity it produces in the broth causes its death; for if, in order to prevent this acetification, a little sterilised carbonate of lime be added, the cultivation is prolonged and the microbe retains for a very long time its reproductive properties.

Sown in milk, it multiplies with great vigour; in less than twenty-four hours that fluid is coagulated *en masse*, and the coagulum has an extreme firmness, the retraction of which gradually expresses the whey in the form of a colourless and transparent fluid. The curd and whey are very acid, and contain in abundance the sown micrococci.

Saccharised broths greatly favour the development of the microbe, but acidity appears more rapidly and intensely; very quickly, too, culture is arrested and the organism dies, unless the precaution is taken of adding to the fluid a little sterilised carbonate of lime. In proportion as the cultivation proceeds the sugar diminishes in quantity, but it does not completely disappear unless the initial quantity of glucose or lactose is very small (about 1 in 100); fermentation, at first very active, rapidly languishes, but

Nocard could not say what the secondary products of this fermentation are.

The micrococcus is at the same time *ærobic* and *anærobic*, being cultivable equally well in contact with the air as without it; while cultivations made *in vacuo* have the same characters and intensity as the other. Coagulation of milk takes place as vigorously without air as with it.

Cultivation in solid media is easy and characteristic. When inoculated by puncture into peptonised gelatine, the micrococcus develops rapidly along the track of the needle, and from the second day, at a temperature of 18° to 20° Cent., the gelatine becomes liquefied on the surface and to a variable depth. The liquefaction rapidly increases, until on the fifth day it has invaded the greater part of the gelatine, forming in the axis of the puncture a kind of inverted cone, at the apex of which the formed microbes accumulate. Throughout the liquid portion the gelatine has lost its transparency; it is opaque, slightly acid, and swarms with microbes. After eight or ten days, all the upper part of the gelatine is liquefied, the liquefaction continuing slowly in the form of a cone with a wide base.

When the surface of the gelatine is inoculated in a streak, the cultivation is marked by a wide furrow, which quickly augments in breadth rather than in depth, and in which the gelatine is also rendered fluid.

Plate cultivation also gives good results. From the second day the gelatine is studded with regularly round, whitish colonies, which develop on the surface as well as in the substance; but those on the surface increase more quickly, and more speedily bring about the liquefaction of the medium around them, producing quite a special moth-eaten appearance.

Examined by means of the microscope, the superficial colony appears as a round, brownish, homogeneous spot, surrounded by a kind of semi-transparent areola. If a tube of solidified gelatine is inoculated by puncture in an atmosphere of carbonic acid, according to Roux's method, cultivation occurs along the track of the needle without liquefaction of the gelatine.

It would therefore seem that the digesting action of the microbe can only be exerted in presence of the oxygen of the air—a circumstance which the results of plate cultivations had already foreshadowed. This powerful digestive action of the micrococcus is exerted, though in a less degree, on blood serum gelatinised by heat.

Broths solidified by gelosis are also good media for the cultivation of this micrococcus. They possess the advantage of not liquefying, and growth takes place along the course of the needle as a white, opaque streak, with festooned borders, and on the

surface in the form of a thick pellicle, which gradually spreads towards the sides of the tube. This pellicle, at first of a dull white, becomes yellow, though never markedly so.

Potato may also be employed, but the culture is never very abundant. It takes place in the form of a thin, viscid, greyish layer, spreading slowly over the surface, and the margin of which, deeply festooned, appears thicker than the centre. Here, also, the growth gradually assumes a yellow tint, though at the periphery it has always a greyish or dirty-white tint.

The results of the inoculation of the microbe of this malady in animals of different species are particularly interesting. The injection of a cubic centimetre of the virulent culture into the galactophorous sinuses of a goat, caused absolutely no disturbance to the animal's health; the milk, even, did not undergo any change. Forty-eight hours after the injection it did not contain a trace of the microbe; its sowing here was barren of result. Injection into the parenchyma of the gland, by means of the Pravaz syringe needle, gave rise to a hot, painful, and somewhat œdematous tumour, which remained localised, and terminated in resolution in twelve to fifteen days, without leaving any sign of induration. At no time did the milk secreted by the inoculated gland appear altered, and broths sown with it remained sterile. The injection of five drops of the virulent culture beneath the skin of a male goat six weeks old only produced an œdematous, hot, and painful swelling, which rapidly and completely became absorbed.

The horse, calf, pig, dog, cat, fowl, guinea-pig—young or adult, did not appear to suffer from the subcutaneous injection of large doses of the virulent cultures; only at the seat of inoculation was there a little œdema and tenderness, sometimes a small inflammatory tumour—but all disappeared very quickly. The rabbit was found to be much more susceptible to the action of the microbe. Generally there formed at the point of inoculation a hot and painful swelling, which gradually increased, limiting the function of the region, and after four to six days terminating in an abscess, the pus of which, though to appearance laudable, literally swarmed with the characteristic micrococcus. But the creature did not appear to suffer much, and continued to eat as usual.

The microbe of this disease, then, would seem to comport itself towards the rabbit as that of Fowl-cholera does with regard to the guinea-pig. Only in one instance has a rabbit succumbed four days after inoculation with five drops of virulent culture, and the autopsy offered the same lesions as were noted in the sheep which perished of *araignée*.

Etiology.—If it be admitted, which does not otherwise appear doubtful, that the gangrenous Mammitis of milch ewes is due

exclusively to the micrococcus just described, the appearance of the malady is explained by the penetration of that micrococcus into the excretory glands of the mammæ. But how is this penetration effected? Is it by the hand of the person who milks the ewe? Nocard thinks this is probable, but the difficulty is to prove it. He had several times smeared and daubed the teats of milch ewes with the virulent culture by means of a brush, yet the disease did not appear. But, on the contrary, the injection of a few drops of the same culture into the teats of the same ewes—the injection being made with a fine blunt cannula so as not to cause the least abrasion of the mucous membrane, caused the development of rapidly mortal Mammitis.

The important subject of etiology therefore remains to be studied.

Treatment.—All attempts at treatment were in vain. The most active antiseptics were injected through the teat into the diseased gland without avail: such as solution of boracic acid, 4 per cent.; sublimate, 1, 2, and 2·5 per cent.; iodine, 1 and 2 per cent.; sulphate of copper, 2, 3, and 4 per cent.; carbolic acid, 2 and 3 per cent. These injections were repeated at short intervals, and were pushed into the gland with such force as to distend all the ducts and penetrate the acini; but no good resulted.

And this may be easily explained on the following assumptions:—

If injections of boracic acid succeed in curing the contagious Mammitis of cows, it is because the microbe of that disease develops in the lumen of the excretory canals of the gland, and the fluids injected into the teat, coming readily in contact with it, can directly exert its toxic influence upon it. But in this ovine Mammitis, on the contrary, when the microbe is introduced into the galactophorous canals, it rapidly overcomes the barrier which the walls of these oppose to its progress, and penetrates to the interstitial connective tissue, where it multiplies with prodigious activity. Here the antiseptic fluid injected into the teat cannot follow it and prevent its proliferation.

The only means of saving, not the udder, but the life of the ewe, is that which the shepherds have carried into practice from time immemorial. This consists in making a crucial incision through the entire substance of the diseased gland, and extirpating in layers the sections thus made; then the wound is dressed with a saturated solution of sulphate of copper, or with an ointment composed of ten parts of finely powdered sulphate of copper to one hundred parts of vaseline. If this treatment is adopted in good time, and before the lesion has extended beyond the limits of the gland first invaded, the ewe is preserved, and it may afterwards

produce lambs and suckle them, but it can no longer be economically employed for the industrial production of milk.

M. Cagny has stated that this affection is frequent in certain flocks in the neighbourhood of Paris, where the shepherds know it as the "Cru." Benion, in his *Traité de Maladies du Mouton*, describes it, and considers it as a gangrenous erysipelas of the mammæ. In each of the flocks which Cagny had observed, the number of births is 100 to 150 annually, and every year there are from two to ten cases of the "Cru" in the flock. Death in two or three days is the rule, and not unfrequently the animal is killed on the first appearance of the disease, and its flesh sold as human food.

When, in exceptional cases, recovery takes place, there is elimination of the diseased part by gangrene and sloughing, and the very large wound quickly fills up, leaving a trifling cicatrix; but the ewe suffers so severely that its fleece is completely shed as if its body had been shaved, and it remains weak and emaciated for some months.

During the very cold winter of 1879-80, lambing took place as usual in November and December. The cases of this form of Mammitis were as numerous as before, but, exceptionally, they were all benign. In only one of the ewes seen by Cagny had there been sloughing of the udder, and the wound, larger than the hand, had cicatrised promptly, the remaining portion of the mammary vein being occluded by a clot as thick as a writing quill. Cagny fancied that during cold weather the severity of the disease is less intense.—G. F.

AN OUTBREAK OF ANTHRAX IN NATAL, SOUTH AFRICA.

BY S. WILTSHIRE, M.R.C.V.S., COLONIAL VETERINARY SURGEON, PIETERMARITZBURG, SOUTH AFRICA.

In accordance with instructions, I proceeded to Greytown on the 13th April, 1887, to investigate an outbreak of disease amongst Mr. G. P. Botha's sheep.

After examining a sheep just brought from the flock, I gathered full particulars of the outbreak amongst the sheep to that date, and on further inquiry I learned that Mr. Botha had lost one of his pair of trap horses about the end of last November, or the beginning of December, after a journey to Maritzburg. This horse, a day or two after its return home, began to swell about the neck and breast, but, as the shoulders were slightly chafed from the harness, it was supposed to be from that cause, and the swelling was treated with

fomentations and other simple remedies. The horse, however, became worse, refused his food, and the swellings extended to the jaws, involving the throat and seriously interfering with the breathing. About twenty-four hours from the time he became ill death ensued, and on examination the swollen parts of the throat were found very black, with yellow jelly-like matter effused into the tissues. The blood was very black and thin, and flowed freely while the animal was being skinned; just then eighteen ducks of Mrs. Botha's came along and began to gobble up the blood, but were driven away, and earth was thrown over it. A few days afterwards these ducks became affected with swellings of their throats similar to the horse, and fourteen out of the eighteen died. A few days later one of the dogs belonging to the family was very giddy and ill, and its throat and head swelled, but it ultimately recovered. It was supposed to have eaten a portion of the carcase of the horse. No sanitary precautions were adopted in the way of cleansing or disinfecting the stable or premises.

Nothing unusual occurred from that time until about the 25th of March, when one flock of ewes and lambs were brought home for shearing, and, as was customary, they were put into the stable for the purpose of catching them conveniently. Exactly seven days after, the first case of this disease was observed in a ewe, from which blood was noticed to be oozing from the nostrils, and she was found to be sick; she was removed from the flock, and died about fifteen minutes afterwards.

The second flock was brought home some days after the first, and also placed in the stable for convenience, and they also began to die on the seventh day afterwards, showing precisely the same symptoms and *post-mortem* appearances as the first flock.

I understand that some died in a very few minutes after being observed to be sick: only in a few was blood seen to issue from the nostrils; and all of them had not the swelling of the throat.

I inquired particularly if any other animals on that or the neighbouring farms had shown indications of the disease, or if any human beings had become affected, and I then learnt that the rest of the animals on the farm were all well, but that the Kafirs round about had carried away the carcasses of the sheep that died, to eat, and that one man had died, and some women were sick. At some kraals cats had died, and dogs were ill with swellings in the throat like some of the sheep had, and similar to the horse. I then expressed a fear that cases would occur in other animals, and counselled the utmost precautions so as to avoid contagion, and urged care in the handling of the carcasses, and that the natives should not be allowed to carry away or eat the meat. After examining a sheep that had not long died, and inoculating a

rabbit from it, I returned to Greytown to examine the blood with the microscope, and found it swarming with Bacilli.

The *post-mortem* appearances observed, were great discolouration of the body when the skin was removed, from extravasation of the blood. This was particularly the case from the under side of the neck from the jaws down to the chest, and when it was cut into, it was of a blackish colour, with a yellow gelatinous fluid effused in places. The vessels were distended with blood, which was thin and tarry looking, the clot being very soft. In the abdomen there was some fluid; the mesenteric glands were discoloured; the liver congested; and the spleen (melt) darker than in health, and on being cut into, the contents would run out in some instances from the splenic tissue being broken down. This, however, did not occur in every case, although the spleen was always softer and darker than in healthy animals.

On opening the chest, the lungs were found much congested and discoloured in all cases; the heart also was much discoloured at the top, and soft and flabby. In front of the heart, between the two first ribs, was a large bloody tumour in each case I examined; and I understood from Mr. Botha that it was the same in all the cases.

On the following morning a native boy—an "umfaan"—was brought in to Greytown for me to see. His face was enormously swollen on the left side, and he had a large sore on the cheek. He did not complain of much pain, but had a headache. I then rode out again to continue my investigations, making another *post-mortem* on my arrival, which was not different from the one already referred to. The next day, learning that one of the sick Kafirs was worse, I went to the kraal to see them, and on nearing it, found one woman, who was affected, sitting outside on a stone, and presenting a most extraordinary appearance. Her neck and face were enormously swollen, and she could scarcely see out of her eyes. On her left cheek was a large sore, and there were other small ones here and there. She complained of headache, and said her throat was sore to the touch, but she could eat a little and walk about. Another woman was too ill to come out of her hut, and I found her looking exceedingly ill, and very thin. She had had swellings, but they had gone down; she also had a number of sores about her. Altogether her appearance led me to doubt if she would recover. A little girl, seemingly about eight years old, had a sore on the centre of her forehead, and the place had been swollen, but was gone down. In other respects she seemed well.

Later on I visited one of the flocks and found a sheep sick, with the neck and head swollen similar to the woman I had seen

in the morning. I lanced the swelling, and secured some of the exudation for examination, and I learn that the animal died soon after I left.

On my return to Greytown I reported these cases to the district surgeon for his treatment, etc.

The rabbit I inoculated during my first *post-mortem* died about seventy-two hours afterwards (third day), and presented the same appearances as the sheep that died.

The seriousness of this outbreak will be recognised when it is seen that Mr. Botha lost one goat and 429 sheep out of about 1,200, from the 31st of March to the 19th inst., on which date a cow died from the same disease, and two others were said to be ailing. Of the natives, one man had died, and eight others were affected; and, on leaving Greytown on the 19th, I heard of others being ill, but have heard no particulars yet. I called on the resident magistrate (Mr. Wheelwright) and explained to him the risk the natives incurred in eating this meat, and he immediately sent a messenger to visit the kraals in that part of the country and caution the people not to eat this meat, and tell them of the results to others. Mr. Botha also—acting on my advice—refused to allow any more of the carcasses to be taken away, and was taking steps to dispose of them by other means.

No sudden outbreak causing such a heavy loss has ever been known before in Umvoti County, and considerable anxiety was felt about its spreading. Such anxiety is only natural and reasonable under the circumstances, and the serious nature of the disease causing this mortality will, I trust, rouse the farmers—not only of Umvoti, but all other parts of the colony, too—to a sense of danger of these cases, and lead them to adopt stringent measures for the disposal of all animals dying of disease, no matter from what cause.

My advice to Mr. Botha was to remove his flocks to fresh veldt, and then to carefully collect the sheep that died, and burn them. Such a course would be infinitely more practicable than digging graves, besides having the advantage of destroying all chances of infection from the carcasses; whereas the graves would be sources of disease in the future.

To show how disease is spread, I may mention that in riding across the veldt to see one of the flocks I came across the leg of a sheep, probably carried there by a dog from a Kafir kraal not far away; doubtless similar cases had happened in all directions, thus increasing the danger.

With reference to treatment, it is manifestly impracticable to dose 800 to 1,200 sheep two or three times a day, which would be necessary to do any good, and to get them to eat anything is out of the question. Further, medicinal agents are of little value in

diseases of this kind, even when animals are in the earliest stage, especially if not aided by the most careful nursing, protection from the weather, and general good management, different to what prevails in the Colony.

For prevention, I advised removal to fresh pasturage until the veldt had been burned, subjected to the action of weather, and left unoccupied for some time.

I advised that the stable should be thoroughly cleaned and disinfected with burning sulphur while the walls and floors were still damp; that the place where the sheep had been examined should have grass and rubbish spread over it, and then burnt; and that all animals should be kept away, and not allowed to graze there.

I beg to call attention to the desirability of regulating the sale of the hides, and other products of animals known to have been affected with Anthrax.

The traffic in these things tends not only to spread disease in the locality in which it originates, but also frequently affects woolsorters and others in England, and leads to loss of human as well as animal life.

Since my return to Pietermaritzburg, Mr. Nunn, A. V. Department, has prepared specimens from material I brought with me, and also inoculated a guinea-pig with some of the blood from the sheep—which died about 24 hours after, showing the characteristic lesions of Anthrax. Further experiments are contemplated.

Besides the losses referred to in this report, I found on a second visit that a few more sheep had died, five more natives, and six head of cattle—all cows, I think. The district surgeon rode out with me, and we saw about thirty natives, of all ages and both sexes, with sores on them, some bad, others not so. We were told that other natives were affected in the same manner. The surgeon was of opinion that many of the sores were due to handling and carrying the meat on their heads, as well as from tainted clothing, as their habits are dirty, and they don't wash their clothes or keep themselves clean, like white people.

It is interesting to note the length of time between the death of the horse and the ducks, to that when the sheep became affected; and the fact that only those sheep penned in the stable were diseased, and each flock (the flocks being kept separate) exactly seven days after they were placed in the stable. The cattle were allowed to graze over the ground where the sheep had been skinned, and the contents of the stomachs, etc., were left exposed, until precautions were taken after I had warned the people. It is a wonder the mortality was not greater.

INOCULATION IN PLEURO-PNEUMONIA *VERSUS* "STAMPING-OUT."

BY C. CUNNINGHAM, M.R.C.V.S., SLATEFORD.

PLEURO-PNEUMONIA is a dire disease. Many a good herd has gone down before it. It has been long with us. Some years we hear or see little of it—in others, like a tidal wave, it spreads over the country. Stock-owners rue and dread its ravages. What is the remedy?

Many leading veterinary and agricultural authorities have no doubt on the matter—the cure, the only and perfect cure in their opinion is "*stamping-out.*" The duty of every veterinary surgeon and inspector, according to their views, when called to herds of two, twenty, or two hundred cattle among which Pleuro-pneumonia has made its appearance, is to kill and slaughter every one, and all of those cattle that have been exposed in any way to the contagion. My plain and evident duty when called, as this year, to outbreaks among respectively, fifteen, eighteen, thirty-six, thirty-nine, fifty-six, and seventy-six head of breeding stock and dairy-cows is according to these men not to inoculate, but to kill off promptly all the two hundred and forty animals. To such a course I for one demur. I hope that day may be far distant.

"*Stamping-out*" *is expensive—it costs money.* About two months ago it was publicly and authoritatively stated that the local authority of one of the Western Counties of Scotland, acting on the views of the chief adviser to the Privy Council, had "stamped," and were "stamping-out." They had taken "action," they had killed every animal in every place and district, and wherever the disease had appeared ("save one where inoculation had kept the stock healthy and pure")—such were the words. They had spent £10,000, soon their expenses would reach to £12,000, and before they finished it was expected that the sum required would be £20,000. If it takes £20,000 to "stamp-out" Pleuro-pneumonia from one Scotch county, how much will be required for the clearance of all the affected cities and counties of the three kingdoms? The question is worthy of consideration.

"*Stamping-out*" *may fail.* If "after inoculation certain remain which may produce disease" (we have never seen them, however), it is equally plain that if from stamping-out any escape or are overlooked as bad a result will ensue. Before proceeding "to cook a hare it is necessary to catch it," and before every case of Pleuro-pneumonia can be "stamped out," it must be recognised, reported, and dealt with.

England as a country, in December last was, if we remember aright, officially scheduled as free from Pleuro-pneumonia—it was only in

Scotland that the disease existed. Yet in a border city at that time we heard of at least five outbreaks that had never been reported at all, and the county of Cumberland was shortly afterward, without contradiction in the public newspapers, proclaimed as having been the seat of the disease for the last ten years. Ireland, too, we are told is singularly free, and for many years has been free; it is only in Dublin and its suburbs, and a few other places, where the disease has any home. The West of Scotland, too, compared so favourably. Strange that Scotch farmers should think that Irish cattle bring the disease with them, and that from Lanarkshire and Wishaw our first cases this spring came. It is easy to clear a country or district on paper—how about the reality, the hidden unreported sold-off cases?

The Edinburgh authorities have the advantage of a veterinary adviser who thinks that Pleuro-pneumonia must be "ruthlessly stamped-out"—its market is regularly patrolled by officially-appointed inspectors. Yet last year after my district was free—from the City of Edinburgh Market came an Irish cow, and planted the disease in a stock of twenty-five dairy cows. The banks of a Highland loch in a stamping-out county is about the last place one would expect to find Pleuro—the place looked the abode of innocence and health, yet there, eight weeks ago, lay three sets of lungs, with old patches at different stages in them, beside four others healthy, plainly showing that for at least five months the disease had existed unrecognised and undiscovered. In the face of such cases as these he will be a bold man who will say that "stamping-out" will soon eradicate Pleuro. After spending £20,000, and perhaps twenty times £20,000, he will be a bold man who dare say that the disease and its seeds have gone, that every animal in the British Isles is free from its taint.

"*Stamping-out*" *is cruel, bloody work.* In the newspapers we read of "great slaughterings of cattle," ten here, five-and-twenty there, fifty and seventy not infrequently. The butchers come on the Thursday, and kill all day, on the Friday and Saturday the fell work is continued, and Monday sees the finish. Flayed heads, a cartload of skins, two or three dozen hearts, and livers, and healthy lungs; blood, bowels, offal and open graves, make the quiet steading a perfect charnel-house. All this, because among the stock there have been say half a dozen cases of Pleuro-pneumonia. Three diseased perhaps, and thirty healthy cows have all shared the same fate—the cure, the only and perfect cure of the "stampers-out"—*the poleaxe.* From such scenes may the dairies and dairy-farms of this district long be preserved.

"*Stamping-out*" *occasionally spreads the disease.* Contradictory as this may seem, it can easily occur. A worthy man has a cow

ailing. He is not very sure what is the matter. If Pleuro be present he knows that the men with the knives and steel will soon be busy among his stock till none remain. So before reporting he quietly sends away a few calvers, or good milkers, or young fat stock, which, in several places and at different times sow the seeds of future outbreaks. *We have never yet seen a case after inoculation give rise to a fresh outbreak, but over and over again we have found long-tailed non-inoculated cows from the North of England, from the West of Scotland, and from Ireland, the plain and palpable cause of outbreaks of Pleuro-pneumonia,* in premises and on farm-steadings and among stock where the disease before, in the memory of any one, had never been known. To clean, healthy, uncontaminated places here affected subjects, not inoculated, from cow-killing "stamping-out" districts have unquestionably brought the disease. With all their vaunted "action" and ardour the stamping-out counties are long in getting quit of the disorder. In their midst and under almost their eyes the disease appears to be hidden and to exist.

We have always looked at the suppression and eradication of Pleuro-pneumonia in a quiet, plain, and practical way. The place to decide the question is not, it humbly appears to me, the study-table, or the lecture-room, or the society meeting-room—the proper place in my opinion is the byre, the cow-house, the cattle-court, or the pasture-field. There stand the cattle, twenty, forty or eighty, it may be, in number; the diseased subjects, four or half-a-dozen, are plain enough, it needs no thermometer or microscope to discover them, and a *post-mortem* or two places the matter beyond doubt. All are under the same roof or have been at pasture together, diseased and healthy freely mixed. The question stares every one, as it has often stared me, in the face: "What is to be done here? Shall we kill up and slaughter these forty or sixty really good Ayrshire or Shorthorn animals, because a few of their number are affected, or shall we inoculate?"

Taking a quiet look we see, it may be, that a few are in calf, some in full milk and thin, others in fair condition, but few, if any, really fat. As dairy or breeding animals £15 per head here would only be fair compensation to the owner—in all, for forty animals, £600. If "stamping-out" is put in force and the carcases sent by the dozen to the dead-meat sales, £5 per head, after paying expenses, would scarcely be realised; £5 × 40 = £200, leaving the sum of £400 to be paid by the local authority out of the rates as compensation.

Instead of calling on the local authority for such a heavy expenditure, we quietly inoculate the stock, and have every reason to be pleased with the result.

From the beginning of March to the end of May of this year, six

severe outbreaks of Pleuro-pneumonia suddenly occurred in this district, due in every instance (save one, which could not be traced) to the introduction of fresh cows, chiefly from the West of Scotland. Standing behind or surrounded by the several herds, the rival merits of stamping-out and of inoculation pressed home.

We slaughtered the diseased animals, twenty-seven in number, as from time to time they occurred—inoculating the others. We had no deaths from the operation, only one tail required complete amputation. Seventy per cent. of tails were preserved intact, and 234 animals remained healthy, thriving and well, with not a sign of Pleuro about them. Surrounded many of these herds were by cattle on every side, watched by lynx-eyed neighbours ready to pounce on any case of failure. Out at pasture not a stone's-throw from our inoculated cows we have seen herds of twenty and thirty others grazing, yet the disease did not spread. For the cases remaining with circumscribed Pleuro, which the opponents of inoculation say "remain and spread disease," we have looked, and found none. Two cases with old patches in the lung two and four months after the operation we did come across, but these cases were harmless. No new outbreak of Pleuro followed their discovery. Driving past, as we often do, inoculated cattle grazing in the fields, dropping in every now and again into cow-houses where, side by side, fresh cows are standing unharmed beside those we inoculated months ago, we ask ourselves the question: "Have we done well to keep those cattle alive; or would it have been better to have slaughtered them up?" and our voice goes up, as it has long done, unreservedly for inoculation, combined with wise measures of precaution under the Act. To slaughter up 240 cattle because twenty-seven of their number have become affected with Pleuro-pneumonia, or to go into, as we heard the other day, one owner's premises and kill 107 animals because two or three have shown signs of the disease, we simply look on as cruelty and a waste of public money. Quickly as each outbreak occurs, it can be grappled with and suppressed at a mere trifle of inconvenience and expense, and if it be considered best in the public interest to send all inoculated cattle when fit to the shambles, that object could be very easily attained. With a little more power, and for 30s. or £2 compensation per head, we would engage that every inoculated animal in this district goes straight when fit, and by "float" to the slaughter-house. Our experience, we are certain, is but a repetition of that of very many veterinary surgeons throughout the country, who have faithfully tested and tried the operation.

Inoculation rightly performed, there cannot be a doubt, is a triumph of our art. Are we to throw it to the dogs and have none

of it? It will check the worst and most severe attacks of Pleuro-pneumonia. Cattle protected by it "may be with perfect safety put into a herd where the disease is raging, and they will stand unharmed, monuments to its efficacy." Inoculated animals, after a reasonable time, do not contaminate others. Cases remaining with patches of Pleuro and spreading disease are so rare as to leave doubt of their existence. And knowing all this, are we to be called on to throw our thermometers and inoculating needles aside, and take up the poleaxe and apply it all round? For the sake of the good name of our profession, and in the name of humanity and public economy, we sincerely trust not.

When we can so easily and certainly check the spread of the disease—when our inoculated animals after a reasonable time do no harm to others, surely we might be trusted to find ways and means to do away with any other possible danger—real or imaginary. Surely veterinary surgeons and veterinary inspectors who can combat, and combat successfully, the disease itself might be trusted to see every fat inoculated dairy-cow safely by "float" into the slaughter-house; and even in the case of breeding-stock, which are kept on, to devise such safe careful preventitive measures, as would make the spread of Pleuro-pneumonia an impossibility. We see no great insurmountable difficulty in the matter. To this course even the opponents of inoculation could scarcely object. By it our profession would be honoured; we would have full room for the legitimate practice of our art. The taunts now made against it would be silenced. Animal life would be saved, valuable stock preserved, and the country at large benefited. Such a course seems as infinitely preferable to the cruel and disgusting and as yet abortive proceeding—*stamping-out.* It has long been evident to us that if inoculation, as practised by Rutherford and others, had been welcomed ten years ago by the profession as its merits richly deserved, that this course might have been carried out during that time with great benefit and success. We trust it is not too late to begin it authoritatively even now.

Space forbids more than a word or two in reply to certain statements and objections recently made against the operation.

We are told that "the question of inoculation was worked out a quarter of a century ago—that the conclusions are the same now as then—that we have not advanced one step." This statement with us carries its own contradiction. Five-and-twenty years ago Pleuro-pneumonia was the bugbear of our profession, against whose ravages we were almost powerless. Many a time have we wandered through affected stock and looked with pity on the many miserable subjects of the disease, quite unable to help either the stock or the owner, and now what a pleasure it is to do away with

the disease with ease and certainty in two or three weeks, and for months and years in the same premises to find not a trace of it. That is the "conclusion" we like; pity we hadn't it "a quarter of a century ago."

It has long been dinned into our ears that "after inoculation certain remain which produce disease"—strange we have never met with them—and now we hear that "a cow with an encysted mass in her lung is harmless," but woe betide her unlucky neighbours when the capsule bursts! the imprisoned pus and tissue-dèbris will propagate and spread Pleuro-pneumonia. Strange doctrine, and somewhat mechanical pathology!

Given a recent outbreak:—if the plainly diseased animals are at once slaughtered—if those brought to light by the thermometer share the same fate, doesn't it follow that the number left with patches in the lung is infinitesimally small—there may, in fact, be none at all? (and that such is the case the numerous slaughterings throughout the country amply prove). If then the stock is inoculated with thoroughly good lymph, does it not equally follow that there practically is an end to the disease? Soon the successful inoculation throws its shield over the stock. They become "inoculated animals that will not take the disease." After a time "they cannot communicate it to others," and amongst them there is *probably not one* with a circumscribed patch in its lung. Are we then going to kill off such a stock as this? How can it do harm? How can such cows do the amount of harm ascribed to them? Are we to kill off 100 healthy and safely-protected animals? For the sake of destroying the needle in the haystack are we to burn all the hay? To put out the fire in the stackyard are we to burn all the stacks? Surely not in the name of common-sense.

For Rinderpest and Swine-fever, and Glanders and Rabies, or for a long-continued, thoroughly contaminated Pleuro stock, we can understand stamping-out; but for a recent outbreak among previously healthy stock, in ninety cases out of the hundred there is, in our opinion, no manner of need for it.

In speaking thus we would of course again guard ourselves against being misunderstood. We have never advocated promiscuous inoculation—that is the performance of the operation by all and sundry—and by different methods. We know that in the Colonies and on the Continent inoculation has been practised in a manner that we would never for a moment think of:—That Dr. Willems says "The blood and frothy liquid is the best inoculating material," while Rutherford abhors and will have none of it. We know that some take a nice mixture of blood, froth, and beautiful lymph to catch all the good qualities going, and put nice little transverse sutures through the skin of the tail, and consider it a

very scientific proceeding. We know that others use glycerine and lymph, and keep the mixture a couple of years, and consider it very good. That many will not acknowledge their indebtedness to Rutherford, but start on their own account, and by their "scientific departures" produce very peculiar results. From all such we would dissociate ourselves. The system we have long advocated and acted on is the good old-fashioned way which we saw Rutherford practising nine years ago. The clear sherry or "amber-coloured" lymph, freshly taken from a good subject—(in some lungs not a drop—in others abundance)—the worsted thread, the thermometer, the docking-shears when needed (and only now when needed), care, attention, and a good use of one's faculties—the best, the surest, the safest, and the most scientific method in our humble opinion yet introduced.

In leaving the subject, we may be allowed to say that we are glad at last to see many of our profession practising and testing and proving inoculation for themselves. We trust that a little further time and experience may show them more plainly the enormous expense, the great cruelty, and the almost practical inutility of "stamping-out," and the corresponding benefits of inoculation when rightly performed.

To those who think lightly of the operation, "who can do without thermometers and needles," who simply slaughter the first cases, and the disease at once obligingly disappears, we would simply say that their lot seems cast in a happier clime than ours. We hope they may never find their mistake, but if they do, then in their difficulties let them turn like myself to inoculation, let them use the thermometer well, and with it their eyes and ears, and if they do their duty to the operation it will not belie them. Some outbreaks long ago we got quit of by simple prompt slaughter of the first cases, and in far many more we as miserably failed. Our experience without inoculation was occasional success and frequent failure, but with inoculation simply constant success, the disease having invariably disappeared within three weeks of the operation.

We are all veterinary surgeons, we have all had our outbreaks of Pleuro in the past, and probably will have in the future. How have we met, how are we to meet them? The country looks to us to do our best in dealing with contagious and infectious disease. We all wish to do our duty. May we do it according to our light.

CASE OF "TRAUMATIC PERICARDITIS" IN A COW, CAUSED BY SWALLOWING A PIN.

BY J. R. GREEN, M.R.C.V.S., ALFRETON, DERBYSHIRE.

On October 6th I was called upon to attend a cow at Shirland, near Alfreton, said by the owner to be in a weak, "lowering" condition, off food, and had been so for some time. She had come from grass three weeks ago, and had done badly ever since. Upon examining the animal I found her in a very weak and low state—entire loss of appetite, haggard expression of countenance, cold extremities, pulse accelerated and very feeble, temperature 103° F., respiration short and frequent, fæces very thin and light-coloured. She had calved on Saturday, October 1st, and had got rapidly worse since then. On auscultating the chest, only a faint, muffled sound could be heard, and over the region of the heart the "metallic tinkling" sound synchronous with the heart's action could be heard. There was also a dropsical condition of the breast and a well-marked "jugular pulse."

I diagnosed it as a bad case of "Pericarditis, with considerable effusion into the sac" and the thoracic cavity, and from the prostrate condition of the cow I gave it as my opinion that she would not recover. Mr. Langley, M.R.C.V.S., my assistant, who saw the case with me, was also of the same opinion. The owner, who thought that she was only suffering from a cold and loss of appetite, wished me to treat her, which I did until the 9th, when I said that it was useless to do more. On Monday morning early she was found dead in the cow-house.

Mr. Langley and myself made a *post-mortem* examination of the body on Monday afternoon, when the following lesions were found: Upon opening the abdomen a quantity of clear fluid—about five or six gallons—was found, which rushed out on the carcase being tilted over. The liver and kidneys were very pale and friable, and the large veins greatly distended and their walls very thin. The rumen contained a considerable quantity of food, but presented no signs of disease. The reticulum (second stomach) was full of ingesta, and the mucous membrane inflamed, and in some places detached. At the front part of the reticulum, in apposition to the diaphragm, was found a *common brass pin* about 1½ inches long. The point of the pin had penetrated the walls of the reticulum, had gone through the diaphragm, and was embedded in the pericardium. The reticulum, diaphragm, and pericardium were all connected by lymph bands.

In the thorax a similar quantity of fluid was found, but it was of a more purulent nature. The heart and pericardium was enlarged

to about three times its normal size. The pericardial sac was greatly distended with fluid (about five pints) of a yellow colour, and stinking. The heart itself was covered with a thick, granular coating of lymph, and presented somewhat the appearance of a "petrified sponge." At the point of injury the pericardium was firmly attached to the heart; elsewhere it was separated by the fluid. The heart and pericardium, when evacuated of the fluid, weighed 14½ lbs.

The organs were sent to Professor Robertson, at the Royal Veterinary College, London, as a specimen, and as I wished to send them in as perfect a state as possible I did not examine the interior of the heart minutely.

The animal had undoubtedly swallowed the pin, which had found its way into the reticulum during rumination; it had there penetrated the walls and had been attracted to the heart by its action against the diaphragm at the point in apposition to the stomach.

CHOREA.

BY HENRY C. WILKIE, M.R.C.V.S., WOLVERHAMPTON.

I AM induced to make this communication, not because I have any pathological discovery to unfold, but mainly because I believe many practitioners find cases of Chorea very unsatisfactory in their results, and because I had hitherto found them so myself.

A foxhound was brought to me some time since to be destroyed by chloroform, as he was suffering from a very severe attack of Chorea, a sequel to Distemper. I was, however, allowed to keep him, and looked about me for some fresh information as to this disease; but my inquiries did not result in much of any practical utility, and one veterinary surgeon, who has had considerable experience in canine practice, advised me to exhibit bromide of potash and chloral hydrate, and to insert a long *seton on each side of the dog's spine*. I must confess this treatment seemed original, and I was certainly somewhat staggered by the idea of it, but as I had no wish to inflict such savage punishment, especially on an unfortunate creature already greatly emaciated, I refrained from adopting it. However, I resolved not to aggravate nature more than I could help, so I gave a pill containing one grain Nux vomica and three grains Ferri sulph. morning and evening, plenty of animal food, and had him sponged with cold water and thoroughly dried every day. He would take no exercise at first, but in about a fortnight began to trot about, and at the end of a month the twitchings were much less violent; the dog began to lay on flesh,

and had a good healthy appetite. In about three months the twitchings had entirely ceased and did not return. I may mention that this dog was a powerfully-made, typical foxhound, of a celebrated strain which is now unfortunately becoming scarce.

I think there can be little doubt but that, in this case at least, any change which might have taken place in the nerve centres was only temporary (I will not say functional, since so much doubt rests as to the real existence of such a condition), and that the sole cause was the anæmic state of the body. I think the very indefinite *post-mortem* lesions so frequently conspicuous only by their absence (if we except the deficiency of hæmatin in the blood), rather point to perverted nutrition as an exciting cause of the symptoms than to any definite organic changes of nerve cells or fibres.

Although such changes probably exist in many cases and are beyond our ken, as in most cases of Dementia, etc., yet I think any such changes that may exist in Chorea must be only secondary to blood changes of a definite type.

AN INTERESTING CASE.

BY S. M. WILSON, M.R.C.V.S., ARMY VETERINARY DEPARTMENT, ALDERSHOT.

Troop horse, Gen. No. 1281, Royal Engineers. Bay mare, six years old. Admitted May 10th, 1887, as suffering from Adenitis, swelling at inferior part of parotid gland (off side) as of an abscess forming. Fomentations applied, swelling subsided by degrees, and the mare was discharged cured on the 21st of May. She was not, however, sent to duty. There was considerable stiffness about the jaws; when the fingers were put into the mouth on the near side, the mare would move the lower jaw to the off-side and keep it in that position for some seconds, at times nearly a minute. She was very shy about the head, running backwards if approached quickly or suddenly, and experiencing considerable difficulty in mastication. She was put on soft food, viz., bran mash and scalded oats, green grass and hay, left in a large loose box and placed under observation. Meantime it was discovered that during her training, immediately before being admitted for Adenitis, she had reared up and fallen over backwards, the top of her head coming in contact with the stones. This much was reported to me when I took over charge on June 6th. I found the symptoms as above described. I found also that when the mare was turned into the paddock, she found a difficulty at first in getting the head

down to graze. This, however, disappeared in the course of a few minutes, but appeared again each day, when first turned out. On examining behind the ears, over the poll, I found the right side much larger than the near, but there was not the slightest pain on pressure, nor did the mare show any pain whatever except when I tried to open the mouth to any extent. She would then run backwards, and for a considerable time be very shy about the head. Occasionally, when out in the paddock, she would hold her head down, with her nose slightly out to the near side, and run round in a circle to the right; and now and then would run into the rails, apparently not knowing what she was doing. She would also stand in her loose box with her quarters in one corner, resting against the walls, head down as usual. Occasionally, also, she would give a violent start if she heard the least sound from the next box, or if anyone suddenly approached the box door. I consulted several officers of our Department in Aldershot, and we came to the conclusion that it would be well to apply a blister over the poll and a little way down the jaw on both sides. This was done on July 12th. After this I did not notice any change, except that the peculiar trick of holding the lower jaw on one side was not nearly so marked; there was still the same objection to the mouth being opened. I should remark that the mare seemed to suffer much more if turned out in the sun, and as the weather was exceedingly hot at times, this was very marked. I therefore had her turned out in the early morning and evening, keeping her in during the heat of the day.

On the 25th of August, I asked the riding-master to put the dumb-jockey on the mare and try by slow degrees if he could draw in her head. The first attempt was successful, but the reins were not at all tightened. A few days afterwards we tried again, but the mare did not appear to take so kindly to it, and afterwards I thought she was more shy about the head, and experienced more difficulty in lowering it to graze. On Sept. 6th, the third and last trial, she did nothing but run backwards; she was more shy than ever about the head, and indeed seemed generally upset by it. On Sept. 9th I again showed her to Mr. Walters, Inspecting Veterinary Surgeon, and she was brought forward for casting, with a recommendation that she be destroyed, as it was considered that it would be both cruel and dangerous to sell her. This was sanctioned, and she was destroyed on the 22nd of September.

Post-mortem appearances.—Found a large abscess with sinuses leading therefrom, some forwards, others backwards, and others across and penetrating between the funicular portion of the *Ligamentum nuchæ* and the lamellar portion situated above the atlas; contents semi-fluid and of the odour of fresh young peas; the solids con-

sisting of tissue somewhat firm and composed of numberless small oval *fluke*-shaped bodies. Two or more isolated abscesses *in* the muscular tissue and one *in* the *Ligamentum nuchæ* (funicular portion) just behind the occiput; contents consisting of above material, more or less inspissated. Numbers of small masses of inspissated and encapsuled pus in muscular tissue between posterior face of occiput and upper portion of atlas. One mass in the superior portion of capsular ligament, between atlas and occiput, pressing on spinal cord to a slight extent. Exostosis of bone on posterior face of occipital protuberance, and a large, round exostosis on upper and anterior portion of wing of atlas on the *right* side. The *right* condyle of occiput and *right* glenoid cavity of atlas partially united, with removal of the articular cartilage and necrosis of contiguous bones. There had been sprain of inferior dentata atloid ligaments, and there was immense thickening of the superior ones, and of the capsule of occipito-atloid articulations.

Brain.—A depression of 1 by ¾ inch on upper central portion of left cerebrum, corresponding to a protuberance on the cranial surface of left parietal bone. Thickening of periosteum in front and at suture of the two parietals.

It is a noteworthy fact that the parietal bones were enormously thickened. The specimens have been deposited in the museum of the Army Veterinary School.

REMITTENT ANTHRAX.

BY R. W. BURKE, M.R.C.V.S., ARMY VETERINARY DEPARTMENT, LAHORE.

(*Continued from page* 245.)

Post-mortem Appearances.—The blood was dark and viscid. In some of the larger vessels it formed into distinct, long clots—a similar condition having been described by Arloing in *Charbon Symptomatique* of the French. Ecchymoses in the subserous and submucous tissues, but especially beneath the peri, and endocardium were constantly seen. V.S. (1st Class), Clayton also informs me that, in the latter situations, this lesion was never absent in a single case, his observations dating from August, 1886. The walls of the heart were soft and flabby, and the peri-cardial sac contained a large quantity of fluid. The lungs were the seat of congestion, and catarrhal inflammation, being enlarged and increased in weight, owing to consolidation. The Peyer's patches were found congested, and the mucous coat of the stomach showed dark-brown, irregular patches of extravasation. Very often the entire mucous membrane of the small intestine appeared swollen and congested; in many cases, ulcerations were also noticed.

The liver was enlarged, soft and friable. The spleen was also frequently enlarged and indurated, though not in all cases. Dropsical swellings were always present, generally under the arms, in front of the sternum, along the course of the trachea, and in the region of the larynx; also between the thighs, under the abdomen, etc.

Diagnosis.—From Relapsing Fever it is easily distinguishable by the following characters, viz.,—1. In Relapsing Fever several relapses occur during its course, whereas in this disease there is seldom more than a single relapse noted, and if the temperature rises at all after that, it is due to complications. 2. The digestive organs usually exhibit nothing particular in Relapsing Fever (Quain's "Dictionary of Medicine"); in Remittent Anthrax in the horse, digestive lesions, both in the stomach and small intestine, were found to be common in the last outbreak, and are characteristic also of Remittent Fever in man. In the horses of the 19th Bengal Lancers, for instance, which died from this disease, gastro-intestinal lesions were seldom absent. And Veterinary Surgeon Ringe and Nuthall, A.V.D., mention cases of pronounced ulceration which came under their notice in several cases during the late outbreak. They were commonly seen, either as submucous extravasations or complete ulceration, in the stomach and small intestine of ponies belonging to the 8th Huzzars, under my own observation. 3. Pulmonary complications are rare in Relapsing Fever (Quain's "Dictionary"), but frequently existed in the outbreak of Anthrax in horses, both in Mr. Clayton's cases and in those seen by myself. Under the name of *Malignant Catarrhal Fever*, this form of Anthrax was well known to veterinary officers in charge of the late Government studs in India more than twelve years ago. V.S. (First-Class) Clayton tells me, with reference to the present outbreak, he does not remember a single case in which the lungs were found not affected on *post-mortem* examination, his observations extending from August, 1886. 4. Ecchymoses under the endo- and peri-cardium were so constantly seen in my own cases, as well as in those seen by the other veterinary surgeons, as to be almost diagnostic of Anthrax. 5. Paraplegia, Stringhalt, muscular tremors, etc., observed in these cases, are more common to Anthrax, than to Surra. The Principal Veterinary Surgeon in India says, "I have always been of opinion that the disease is Anthrax Fever. It coincides exactly in its symptoms, course, and *post-mortem* appearances with the disease as it has been known at the various stations in the Punjab." Facts everywhere show the widespread prevalence of Anthrax in all countries; and India is behind no other country in the world in the number of outbreaks of this disease seen in our animals. The mortality is high, which

is more common to Anthrax than Relapsing Fever (Quain's "Dictionary"). The cyanosis, or purple colouration of the conjunctiva, submucous extravasations in the stomach and small intestine, the constant ecchymoses under the endo- and peri-cardium, the lung complications, etc., are common to Anthrax and not Relapsing Fever.

The results obtained by the Principal Veterinary Surgeon's inquiries from the reports of veterinary surgeons in different stations in India, confirm and extend what has been known from clinical experience of the characters of Anthrax seen in other countries; and the exact knowledge obtained by the methods of inquiry employed, by carefully comparing the temperature charts, symptoms, and *post-mortem* appearances of different cases at different stations, will lead to an important investigation of the behaviour of this disease, and thus to a more exact method of treatment in the future. The results so far offer a field of research which requires the highest degree of patience and ingenuity on the part of the investigator. The diagnosis may not be easy in a few complicated cases, but due observation of the peculiar combination of symptoms will enable careful practitioners to make a good practical diagnosis.

With reference to its clinical features, it has been stated that Relapsing Fever in the horse is "invariably fatal" (see Steel's report on Relapsing Fever). Reference to the literature of Relapsing Fever shows that this Fever is fatal only in about two or three per cent. of the cases witnessed.

Mr. Steel describes ulcerations in the stomach and intestines, and other structural changes of important organs as frequent in equine Relapsing Fever, which is opposed to general experience regarding both human Relapsing Fever and Surra in the horse. On reference to this point, I note that Dr. Evans was most careful in pointing out that absence of structural changes was peculiar of Surra (see VETERINARY JOURNAL, July, 1881, p. 6)—a disease Mr. Steel has stated to be synonymous with Relapsing Fever. Mr. Oliphant, Principal Veterinary Surgeon in India, in his D. O., dated 12th February, 1887, writes: "Some of the *post-mortem* appearances given in Mr. Steel's report are those of Anthrax. I have seen very extensive outbreaks of both diseases, and there is very little resemblance between the *post-mortem* appearances of the two. In one outbreak of Surra in the 18th B. C., in which 180 horses died, I made dozens of *post-mortem* examinations, and the appearances all were identical—extreme pallidity of all the tissues, with perhaps a trifling serous effusion into the abdomen, etc. In fact, the animals looked as if they had been starved to death."

The digestive organs usually exhibit nothing particular in Relapsing Fever; whereas in the cases Mr. Steel describes as Relapsing Fever, these lesions were seldom absent.

Pulmonary complications are rarely seen in cases of Relapsing Fever; whereas they were so constantly present in the Meerut outbreak as to be almost diagnostic.

The interval of freedom lasts usually a week in ordinary Relapsing Fever, and four or five relapses at most (usually only one or two) have been seen in practice; but Mr. Steel records an interval of four or five days only, and an unlimited number of relapses in the usual run of cases he witnessed in the Burmah ponies.

The conclusions to be arrived at from the above data may be briefly summarised thus:—

(*a*) That several different diseases, possessing entirely opposite characters, have been probably considered under favourite designations.

(*b*) That in many cases two or more diseases have co-existed in one and the same patient, the one supervening on the other.

(*c*) That an unlimited number of relapses, noted every 4th or 5th day, point most clearly to the existence of Intermittent Fever (Quartan), pure and simple, and that organisms of the kind first described by Dr. Evans as characteristic of Surra, appearing in the blood, may be due to Surra supervening on a purely Intermittent type of Fever.

(*d*) That the presence of Anthrax organisms in the blood may be similarly due to Anthrax supervening on Fever of a purely Intermittent or Remittent type.

(*e*) That the presence of *filaria of various species* in the blood of many animals is a very frequent concomitant of health, and is therefore not in any way related to the diseases in which they have been noted (see "Parasites in the Blood" in *Lehrbuch der Speciellene Pathologie und Therapie der Hausthiere*, by Friedberger u. Fröhner, 1886; also VETERINARY JOURNAL, January, 1887; and Dr. Evans' paper on "Surra" in the VETERINARY JOURNAL, July, 1881, p. 10). Under weakened states of the body, as in Surra, doubtless the parasites multiply rapidly, and even assume pathogenic properties. (See "Filaria Immitis in the Heart of a Dog, Death," in the VETERINARY JOURNAL, December, 1881.)

There is every likelihood that in Surra a state of system exists which is peculiarly fitted for the growth and multiplication of parasitic organisms. In some parts of Europe endemic visitations of pernicious Anæmia are frequently noted, especially among the poorer classes. The patients sometimes appear ill for several months before any prominent symptoms of the disease are noticed, save a progressive Anæmia, which gradually destroys life from simple exhaustion.

(*f*) That pernicious Anæmia in man is probably allied to Surra. I will for the present assert that Surra *is* prenicious Anæmia of the horse.

(g) That there is an Intermittent as well as a Remittent form of Fever in the horse has been clearly proved, I think, by the temperature charts and *post-mortem* changes recorded in the outbreak in Meerut, as well as in other stations of which clinical reports and charts were furnished me for information, through the courtesy of the Principal Veterinary Surgeon, at that time of my investigations. I may state here that, so far as the *post-mortem* appearance of the disease are concerned, V.S. (First-class) C. Clayton, A.V.D., has preceded me in suggesting, before my investigations were commenced in Meerut, that "probably" the horse suffers from a form of "Malarial Fever" of which the profession has taken no note in the past; and this is what was proved by the temperature charts of cases investigated by me in Meerut.

(h) That, probably, Surra and Relapsing Fever are two distinct diseases—as distinct as Remittent Fever is from Intermittent, or Anthrax from Surra, etc.

(i) That the presence of Anthrax may be asserted positively by the presence of rods peculiar to this disease; *(b)* which, moreover, stain readily in special colouring fluids; and *(c)* are inoculable in suitable media and in susceptible animals.

The question arises—Is there a form of Intermittent and Remittent Anthrax in our animals distinct from the simple forms of Intermittent and Remittent Fever, or is the one only a precursor of the other in most cases? Reference to the literature of the subject shows me that we must at present acknowledge both views to be correct; for many continental veterinarians, and Bollinger in particular, have noted the occurrence of Intermittent Anthrax in cattle to be frequent in some parts of Germany; and Röll and Professor Dieckerhoff, both describe this form of Anthrax as common in Germany (*vide* Röll, *Lehrbuch der Pathologie und Therapie der Hausthiere*, 1885; and Dieckerhoff, *Lehrbuch der Speciellene Pathologie und Therapie für Thierarzte*, 1885). The mortality also was so high in the early part of the Meerut outbreak as to preclude the possibility of the disease being only *simple* Intermittent and Remittent Fever; but that some few cases were those of simple Intermittent and Remittent Fever is not only likely, but, I think, very evident. Indeed, there is no evidence to reject the possibility of Intermittent and Remittent Fever and Anthrax having co-existed at one and the same time and in the same patients, as Emphysema Infectuosum and Anthrax described by Feser, Bollinger, and others on the continent of Europe. (See VETERINARY JOURNAL, February, 1887).

We have no mention in veterinary literature of simple Intermittent and Remittent Fever affecting the horse; though there is no reason why the lower animals should not suffer from these Fevers as well as

man. Indeed, that the horse does suffer from the above mentioned types of Fever may be assumed as a fact established by the temperature charts kept by me in the case of ponies belonging to the 8th Hussars, in the present outbreak. These charts, moreover, prove, in the first place, that Intermittent and Remittent Fever in the horse bears the same relation to Anthrax as Emphysema Infectuosum, for example, bears to Anthrax, and they also, in the second place, demonstrate the possibility of Anthrax being complicated with cases of simple Intermittent and Remittent Fever. It may be stated, with reference to Remittent Fever, that there is a morning remission of usually one degree noted in health, and as a purely physiological process; but I know of no "physiological process," either in man or animals, in which the morning temperature ever falls five and six degrees below that of the evening! There are manifestly three distinct kinds of diseases with which the veterinary surgeon must in particular contend in future, among others—Intermittent Fever, Remittent Fever, and Anthrax; and, very frequently, any one of the above supervening on the other, and even complicating each other, as in the present outbreak. Veterinary science has no broader or grander avenue for investigation than the subject of Fevers in the horse.

Etiology.—Some blood sent for my examination previous to my arrival in Meerut showed very different results in different cases. Thus, the first blood enclosed in hermetically sealed tubes showed merely putrefactive organisms. In subsequent blood, mounted fresh on slides, I found, on examining under a one-twelfth objective, several small bacteria, in the form of spherical or slightly oval points, either isolated or in clusters, and which existed in greatest number towards the circumference of the cover glass. I scraped some of this blood on the point of a penknife, and, after diluting it in water, injected a very small quantity under the skin of a rabbit, which died in the course of a couple of days, presenting innumerable longer or shorter rods in its blood examined under the microscope, similar to the *Bacilli Anthracis* seen in other animals when suffering from Anthrax. Similar injections subsequently made on these animals also produced death, the blood containing numerous rods and chains. Consequently, when I arrived in Meerut, I informed the Inspecting Veterinary Surgeon the result of my examinations of the blood I had received from Meerut, before proceeding to study the clinical aspects of the disease in the horse. Next day a horse affected with the disease was shown to me by Veterinary Surgeon (First Class) C. Clayton, and on examining some blood taken from the angular vein, and placed under the microscope while it was yet fresh, I found the same organisms present which I had seen on slides previously

prepared for me, and which were afterwards examined also by Veterinary Surgeon (First Class) C. Clayton, A.V.D. I am glad that I had an opportunity of showing these organisms to Inspecting Veterinary Surgeon Hallen, when in Meerut the other day. Veterinary Surgeon (First Class) Glover also saw one or two slides containing blood from a stallion which had succumbed to the disease some days previously, and in which several short rods were present, both single and in clusters. These rods stained readily in methylene violet and Bismark brown solutions (obtained through Treacher and Co., of Bombay). Since then, numerous slides have been examined containing fresh blood from affected animals, and have always yielded the same organisms, but more during certain stages of the disease than during others. When the fever is not high, they are sometimes difficult of detection, or may be even altogether absent. In the first cases from which blood was sent to me in hermetically sealed tubes and on slides for my inspection, I was unable to trace the presence of any parasites; and this may be owing probably to the fact already explained by Dr. Fleming in the VETERINARY JOURNAL for September, 1878, namely, that blood collected in tubes deprived of air and hermetically sealed has been shown to lose all activity in about ten days. Pasteur's view of the germs of Anthrax being brought up to the surface by earth-worms has also been disproved on this hypothesis, as the *Bacilli Anthracis* practically perish in about ten days outside the animal body and when deprived of oxygen (Toussaint), as they would be in hermetically sealed tubes and under compressed cover-glasses. The slides sent for my inspection, moreover, had the cover-glasses carefully glued on at their circumference, which completely deprived the organisms of air. Lastly, Veterinary Surgeon Chicoli (*Il Medico Veterinario, March*, 1876) states that during the year 1875, there appeared in the district of Corleone, Sicily, an enzooty of Anthrax among mares, in which all the lesions of Anthrax were found to be present, on post-mortem, but no bacilli could be discovered in the blood. And yet it was impossible to deny that the disease was Anthrax; for, the same disease which broke out among the bovines—driven into the pastures vacated by the mares—was characterised by an abundant development of the bacilli in the blood.

Pathology.—Dr. Wallace Taylor, who studied this disease in Burmah ponies in 1880-1, known under the name of "Kakke," describes the presence of a small, rod-shaped bacillus in the blood of every case examined, which he found to measure a little longer than a tubercle bacillus, and slightly also thicker than it. He suggests that it is probably identical with the bacillus found in "Beri-beri" of the human subject. But, as Dr. Taylor did not

try any inoculation experiments on animals, or use even staining re-agents, he was not in a position to come to any classification of an organism he was certainly the first to describe in this country. It will be understood, without our saying so, and merely from the size of the organism described, that it is the *Bacilli Anthracis* which Dr. Taylor actually noted. The determination of a particular species of organism, merely from its outward appearances, however, is not always an easy task, and only comes through a complex, and sometimes tedious, method of investigation. Experience has now suggested two great roads to inquiry, which lie in a direction that investigators a few years back did not look in; they are staining tests and inoculation experiments. We know that many known micro-organisms may now be stained by special staining re-agents, and, in regard to these bacilli staining readily in methylene violet and Bismark brown solutions, in addition to their size and morphological peculiarities, conclusively establish their identity with the *Bacillus Anthracis* met with elsewhere. While the history of the short rods producing longer rods and chains on inoculation of rabbits still further establishes this identity, when taken in connection. It is well known that the microbes of Anthrax multiply by spores as well as by fission; and there appears very little doubt but that the smaller rods seen by me in this disease, side by side with the longer ones, bear the same relation to one another as a part does to a whole —the first being, in fact, simple off-shoots from the parent rods. One can readily understand, too, the large numbers of the smaller rods in comparison with the longer ones, as the same difference in numbers between parent and offspring would be found among other species also, from the lowest forms of life to man himself! And the germs of this disease prove no exception to the rule; on the contrary, they serve as a striking illustration of the supremacy of younger over parent life. So much so is this the case, that a leading characteristic of this disease was found to be the comparative absence of longer rods and chains in the blood of our patients, other than the rabbit, in which latter chains and rods usually abound. So scarce are the longer rods that Toussaint considered the smaller ones, as seen in this disease, to be peculiar of an outbreak of Anthrax he saw in France a few years ago, and suggested they should be regarded as a distinct species, differing from the *Bacillus Anthracis* in its physical characters, but possessing similar properties of engendering virulent Anthrax on inoculation of a healthy animal.

(*To be continued.*)

Editorial.

LEGISLATION AND VETERINARY SCIENCE

In the remarks with which Earl Spencer, who acted as chairman at the opening of the Royal Veterinary College on October 2nd, supplemented the address by Professor Lowndes, reference was especially made by his Lordship to the two schools with which he was more particularly acquainted in regard to animal diseases of a communicable nature—the legislative and the medical; and while he did not pretend to know much about the latter, he confessed to a serious acquaintance with the former. And perhaps there are no statesmen in this country who can lay claim to a more thorough knowledge or wider practical experience of legislation in its effects upon the disastrous plagues of animals, than the distinguished nobleman who so well presided over the assemblage of veterinary surgeons and students in Camden Town. For he was President of the Cattle Plague Committee which sat in 1865 to investigate the nature of, and devise measures for dealing with, the terrible scourge which had been allowed, through stupidity and supineness, to spread itself over the kingdom, and almost ruin a most important section of our agriculture; and while Lord President of the Privy Council he had to deal with the limitation and suppression of that and other infectious disorders, so far as legislation is concerned. The enlightened and energetic manner in which he discharged his onerous duties in these capacities certainly entitle him to a far wider recognition as a public benefactor than has been awarded him, and the veterinary profession has certainly every reason to consider him as the statesman who has done most to advance legislation for the control and extinction of contagious diseases among animals, as well as the one to whom it owes the Veterinary Surgeons' Act of Parliament. Therefore, on the subject of legislation in the matter of spreading destructive maladies, Earl Spencer was well entitled to address the veterinary profession. But it is evident from his remarks, that the necessity for legislation to cope with such enemies to our animal population is rather a reproach to veterinary science, and that curative measures are to be preferred and sought for instead of resorting to the prompt and always efficacious stamping-out process sanctioned by law. This, it must be confessed, is the popular notion, but it is scarcely a sensible one. What veterinary science should do in dealing with such diseases, is to indicate the quickest, most certain, and least expensive and troublesome way of getting rid of them; it is purely an economic question, and if it is more advantageous to kill a few animals to prevent the spread of a disease, no matter how amenable it may be to scientific medical treatment, than to have many thousands to cure, then the legislature ought to prescribe

the former and discountenance the latter. It can be no reflection on our science that it indicates slaughter of infected creatures to stay the progress of even an easily-cured contagion, when it has shown that this step possesses every advantage—when combined with other sanitary measures which it recommends to legislators—over medical treatment. Indeed, it must be looked upon as a most unselfish, and even personally prejudicial course to suggest, as from a mercenary point of view medical treatment of such disorders would be immensely more beneficial to veterinary surgeons than the stamping-out system by slaughter and disinfection. To keep a contagious disease alive in the country, simply that veterinary surgeons might be profitably employed in curing the sick animals, would be extremely selfish, and indeed unpatriotic, though it might look more scientific. The fact is, legislation and sanitary science must go hand-in-hand; the one cannot dispense with the help of the other, for it is only upon their combined action that communicable diseases can be kept at bay, and finally exterminated. It can be no reflection on veterinary science that it needs legislative aid, in order to enable it to grapple successfully with epizoötic maladies. The truth of the maxim, that "Prevention is better than cure," no one can dispute when considering these, and though its being carried into effect is adverse to the interests of veterinary surgeons, yet without the participation of their science legislation would not know when, where, or how to intervene, nor how to make its intervention absolutely effective if it chanced to do so without scientific guidance.

In the prevention and suppression of contagious diseases veterinary science is more favourably situated than medical science, and the legislator cannot stir without invoking its aid; while by means of its teachings, if he will cause them to be carried into effect, the scourges which afflict animals, and prove so hurtful to the welfare of man, can be entirely abolished. Surely this is a more scientific and desirable aim than the discovery of cures or the adoption of medical treatment, no matter whether this be uniformly successful in its results.

RABIES AND HYDROPHOBIA.

SUMMARY OF EVIDENCE TAKEN BY THE SELECT COMMITTEE OF THE HOUSE OF LORDS, BY JAMES LAMBERT, F.R.C.V.S., INSPECTING VETERINARY SURGEON, ARMY VETERINARY DEPARTMENT.

THE report of the Select Committee of the House of Lords, Session 1887, on Rabies in dogs, has now appeared in a Blue Book, and as it is a subject of the greatest interest to the profession, it is hoped that a short summary of the scientific and other evidence may be of advantage to the readers of the VETERINARY JOURNAL.

The following peers constituted the Committee:—The Lord President—Lord Cranbrook—Duke of Beaufort, Earl of Coventry, Earl of Carnarvon, Earl of Onslow, Earl of Zetland, Earl of Kimberley, Lord Walsingham, Lord Ribblesdale, Lord Poltimore, Lord Mount Temple, and the Earl of Miltown.

The witnesses will be quoted in the order in which they gave their evidence.

Professor Victor Horsley, F.R.S., F.R.C.S., of the Brown Institution, says: He is perfectly convinced that the virus of Rabies is alone maintained in existence by transfer from animal to animal, and that it is universally admitted by scientific men to be a microbic, or, in other words, a germ, disease. He is convinced that there is no such thing as spontaneous Rabies. Rabid deer can communicate Rabies to other deer by biting. Although deer have no upper incisors, yet rabid ones can worry each other very much, as has been seen in instances at the Brown Institute. Rabies is not more aggravated by climatic conditions, such as heat and cold, soil, etc. One particular breed of dogs is not more susceptible than another. Lancashire, owing to the large number of dogs kept there, affords most cases of Rabies. Rabies in London was much decreased by the muzzling regulations of 1886. Thinks legislation regarding the disease should be universal, and that effectual muzzling would stamp out the disease, and the very fact of a dog not having a muzzle would indicate that he should be at once seized. About 40,000 stray dogs were destroyed in London in 1886.

The average period of incubation of Rabies in a dog is six weeks; in man the average period may be the same, or a little more, but in both the time is often longer, even sometimes up to six months or more. The preliminary signs and symptoms of Rabies should be printed on the back of each dog license, as suggested by Dr. Fleming long ago. Rabies in dogs always terminates by paralysis, first of the hind legs, and then of the rest of the body. In Dumb Rabies the preliminary stages of excitement or aggressiveness are very slightly marked, and the animals soon become paralysed; the jaw becomes paralysed early, and the dog cannot bark, hence it is called dumb madness. Thinks that if persons are not subjected to M. Pasteur's treatment until after the tenth day it is too late. Has preserved the spinal cords of rabid dogs for a month, and then found them still virulent. A person cannot be pronounced safe until six months after M. Pasteur's inoculation. Rabies in dogs is most prevalent in autumn. Recommends, to stamp out Rabies, the compulsory muzzling of dogs throughout the country as well as in towns, except to sporting dogs while under control. His friend Dr. Dowdeswell has, by experiments, shown distinctly that the spinal cord is not infective until the infected animal begins to show symptoms, which is very strong evidence to show that the animal's saliva is not previously infective. In Scandinavia—that is, Norway and Sweden—muzzling is enforced, and it has stamped out Rabies. There is a six months' quarantine there, as there is also in New Zealand. The Prussians think that Rabies is oftenest introduced into their country from adjoining Russia. In Vienna puppies are subject to the payment of the dog-tax from the day on which they cease to be suckled. All dogs in Baden carry the address of their owners on their collars, and if a dog is seized by the authorities as rabid, the owner can be at once referred to in order to ascertain whether any other animals have been bitten, etc. This regulation has done immense good, and there has been no reported case of Rabies in Baden for some time. Foreign legislation comprises three elements—quarantine, muzzling, and registration. The best condition of a district would be that dogs should be duly registered, the tax paid regularly, and all stray dogs cleared off. Believes that healthy dogs have an instinctive dread of a rabid one when symptoms are developed; has often seen this. The symptoms of Hydrophobia have remained the same, as we know from trustworthy records, for quite two thousand years. The disease was well recognised by Hippocrates and his contemporaries, and was then called "Lyssa."

The death-rate from rabid wolves is high, because the wolf makes a very

severe wound, and invariably attacks the head. Thinks the best caustics to employ for rabid bites are nitrate of silver, the hot iron still better, but best of all, pure carbolic acid. Thinks only ten per cent. of persons bitten by rabid dogs contract Hydrophobia. M. Pasteur does not think that in his system of inoculation he is introducing a weakened or attenuated virus, such as we believe we introduce in the case of vaccination, for example; but he thinks that he is introducing a chemical substance, the product of the life of the micro-organism or disease germ. This chemical substance hinders the development of the life of micro-organism, and this it is which he is putting into the patient.

Professor G. T. Brown, C.B., M.R.C.V.S., thinks that Rabies is never spontaneous, and that this is as clearly proved as anything in science. Dogs have been in France experimentally subjected to all kinds of hardships without producing anything resembling Rabies. The evidence is quite clear that no condition of climate can produce the disease, or, indeed, much influence its spreading when it is once introduced. It broke out in Lapland, but was quickly stamped out, and that country is kept free, like Sweden and Norway, by practically prohibiting the importation of dogs. After the symptoms of Rabies are developed, a dog may look quiet and intelligent, yet will fly at any person going near it. After an animal has become infected, there are no symptoms until the incubation is completed. Believes that if universal muzzling were efficiently carried out for twelve months, we should get rid of the disease in this country, and agrees with Professor Horsley that muzzling is the most simple, perfect, certain, and effective method. Death occurs, after the symptoms are developed, in three or four days, or within a week.

Professor William Pritchard, M.R.C.V.S.: In the case of dumb madness, the muscles of the jaw become paralysed, and the jaw drops by its own weight, and the animal is unable to bite except by a spasmodic jerk; but the saliva of such a dog is just as poisonous as in the case of the rabid form of the disease. In the case of ordinary Rabies, the distinctive symptoms are mainly the frenzy of the animal, and desire to bite anything he may come in contact with. The number of deaths from Hydrophobia has considerably decreased in consequence of stray dogs being destroyed. One of the indications of Rabies coming on is the dog's endeavouring to escape from the house. Thinks that a dog found without a muzzle (if muzzling regulations were in force) should be immediately seized, whether affected with Rabies or not. If universal muzzling were undertaken, it should be done by the central authority in London. He had a dog in which the period of incubation was a year and three months, but does "not unfortunately possess any records of the case," although he is quite positive about it. Would certainly advocate muzzling dogs to get rid of Rabies, provided it was universally done. Is firmly of opinion that there are rabid foxes in the country in a wild state. As to difference between Epilepsy and Rabies, the epileptic fit comes on at once, without the dog showing any symptoms of illness of any kind previously. He is unconscious, and does not know what he is doing, whereas in Rabies he is intentionally mischievous.

Mr. A. J. Sewell, M.R.C.V.S., says that more than three-fourths of the dogs killed by the police in London were suffering from Epilepsy, and not from Rabies at all. There is no comparison between the two diseases whatever. Agrees that if muzzling were effectively carried out throughout the British Islands it would stamp out Rabies, provided also that the importation of dogs was prohibited. If he saw a dog during life he could be quite sure whether it was rabid or not by the symptoms. In some cases when Rabies is first developing the dog is just off his food, and nothing more is observable. In cases of Rabies it always appears to be the last thing suspected by the owner. One of the first symptoms of Rabies is to attack other dogs. No

case of Hydrophobia has occurred among the London police. A few of those bitten were sent to M. Pasteur last summer. The use of the muzzle has considerably diminished Rabies in London, and there is no cruelty in applying a properly made muzzle. Thinks that universal muzzling would stamp out the disease in less than twelve months. Would recommend a regulation muzzle, which consisted of just a wire front kept on by leather straps, and thinks that with that pattern there is no cruelty whatever. Does not think that Rabies can be developed spontaneously.

(*To be continued.*)

THE EFFECT OF SALTING UPON THE VIRULENCE OF ANTHRACOID PORK.

BY F. PEUCH.

(Comptes Rendus de l'Académie des Sciences de Paris. Tome cv. 1887. No. 5.)

As experience has demonstrated that swine die of Splenic Fever, the author considered the investigation of this question of importance. He took the leg of a pig which had succumbed to the disease, and inoculated two guinea-pigs from some of the juice, and thus demonstrated its virulence. After the inoculation the leg was kept in pulverized sea-salt for six weeks. A piece of the flesh was then excised, soaked for two hours in filtered water, and passed through a press. With the resultant juice he inoculated four guinea-pigs and three rabbits. The result, beyond slight swelling and redness of the part, was negative. Inoculation of a flask containing sterilised beef broth, incubated at a temperature of 30°C. for several days, produced innumerable cocci and bacilli. From this growth a rabbit and two guinea-pigs were inoculated with negative results. But imperfect salting left the meat virulent. A ham was salted for fourteen days, was not completely covered, but nevertheless gave forth no putrefactive smell. The juice from this leg was virulent. Three rabbits were inoculated; one died in ninety-six hours. Three guinea-pigs were inoculated, and they all died as well as the rabbits of Anthrax. A guinea-pig was inoculated from a cultivate of the juice employed, and it also succumbed to Anthrax.

OF THE VIRULENCE OF TUBERCULAR MATTER AFTER HEATING, DRYING, SALTING, FREEZING, PUTREFACTION, AND SOAKING IN WATER.

BY GALTIER.

(Comptes Rendus. Vol. cv. 1887. No. 4.)

THE author reports that desiccation for several days, great changes of temperature, and freezing, failed to destroy the virulence of the bacillus. Salting for several days also had no effect upon it. He then draws attention to the necessity for sanitary precautions connected with the treatment of consumptive patients, both human and quadrupeds, and of the necessity for properly treating the straw, evacuations, etc. Diseased animals may infect anything they come in contact with by their excretions, particularly drinking water. If the patient's intestines are tubercular, the fæces are infectious; if the kidneys, the urine. He reproduced Tuberculosis by inoculation from the urine of a tuberculous rabbit. In order to prevent the spread of the disease to man and animals, Galtier insists upon the necessity for thorough disinfection of everything a tuberculous animal has come in contact with—the evacuations, the stable, the bedding, etc., etc.

SYNOPSIS OF A PAPER UPON SADDLE GALLS AND ALLIED INJURIES AMONGST CAVALRY HORSES.*

BY F. PETERS, SENIOR VETERINARY SURGEON 17TH MECKLENBURG DRAGOON REGIMENT.

AFTER pointing out that saddle galls occupy a very important position in veterinary surgery on service, and that it is necessary to use the simplest therapeutic agents, the author draws attention to the absolute necessity there exists for a thorough knowledge of the causes which may give rise to this class of injury, in order that animals with slight galls may still be ridden without aggravating the malady. It is the first duty of the surgeon on active service, where horses cannot be thrown out of work, to arrange mechanical contrivances whereby the injury may be so relieved from pressure that the horse can be ridden without the gall becoming worse at any rate, and often cured.

Peters divides saddle galls into sore withers and sore backs.

Causes of Sore Backs or Panel Galls.—The accidental causes, such as sand or small stones under the numnah, dried-up sebaceous secretion, careless saddling, or lounging of the rider, come more under the province of military discipline. Long experience has convinced the author that sore backs are not so much due to the above causes as to faulty position of the saddle.

The "Bock saddle," on account of its strong and inelastic make, is well suited for hard wear on active service; but it has the important disadvantage that its rigidity prevents it adapting itself to the changes in shape of the horse's back which occur, particularly in weak-backed horses. This may be remedied in peace time by changing the saddles or alteration of the stuffing; but on service these alterations may take place throughout the horses of an entire regiment in a few weeks; the material is not then always at hand. As the changes referred to, from hard work and deficiency of forage, take place according to certain anatomical and physiological laws, it is possible, if guided by a knowledge of these laws, when selecting the saddle for each horse, to prevent, to a great extent, the bad effects of emaciation.

Changes in the Vertical Section of the Back (*Querschnitt*).—The panels of the saddle, as is well known, rest upon the very thick, elastic, and soft muscles of the back which have the ribs for their foundation. It is also well known that neither emaciation nor its opposite has any effect upon the position of the ribs, whereas atrophy or hypertrophy of the muscles have a most important influence upon the shape of the back. The change will be in direct proportion to the thickness of the muscular structure of the part. As the muscular structure is thickest close to the spinous processes of the vertebræ, it follows that in emaciation the falling away will be greater at this part than farther away (laterally). Therefore this part subsides more. Now take a saddle which fitted a horse when fat, and try it on the same horse when lean, and it will be found that the outer edge of the tree rests upon the back, but the inner edge does so only slightly, or not at all. Changes in the dorsal section of the back are without doubt the cause of the frequent saddle galls from "Bock saddles." This view is supported by the frequency with which the galls occur under the outer edge of the trees in horses which are poor, or have become so.

To prevent these galls it is therefore necessary, when fitting the saddle before going on service, to see that the inner edge rests somewhat more firmly upon the back than the outer, because all horses fall away more or less.

It has been shown that where the muscles are thicker the falling away is

* Translated from the *Archiv f. Wissenschaftliche und Praktische Thierheilkunde*, by F. Raymond, A.V.D.

greater. This, therefore, occurs to the greatest extent near the withers. In such cases the saddle will tend to slip forwards under the weight of the rider. In bad cases, the bridge of the saddle will rest upon the top of the withers, and thus cause damage.

Peters points out the vast importance of constant inspection of saddlery on service or when forage is scarce. He states that galls to the anterior part of the back are comparatively rare (in Prussia).

Sore Backs and their Treatment.—The author says that sore backs in cavalry are of less importance than sore withers. He points out that all galls should receive immediate attention. There are two great systems of treatment—the cold water and the warm water. He recommends the cold at first, particularly for slight cases, and the warm when there is suppuration, etc. He thinks moist clay a good means to apply the cold method. In case of large serous abscesses, he says it is useless to employ other than surgical means, and recommends that the abscess be emptied subcutaneously, then treated with gentle pressure and energetic application of cooling remedies.

As to the treatment of hard, black "sitfasts," undermined with pus, the author states that the healing process will not go on properly so long as the necrosed tissue is present. It is therefore necessary to use energetic surgical means, and to remove it with the knife; but it is not advisable to proceed in this manner where there is a recent sore back, because the outline of the dead portion is not properly defined. But he again points out that the duty of a veterinary surgeon on service is not to operate when all the horses of the corps are wanted, but to patch up, to prevent things getting worse, and to seize an opportunity for radical cure when the regiment gets into cantonments, or is otherwise resting.

Padding of the Saddle in treating Sore Backs.—Peters recommends the padding of the saddle with straw or felt, tow or canvas. The part in apposition with the gall should be removed. He points out that the greatest care is required in applying this method, otherwise bad results follow. He says that straw made into a mat is the cheapest and readiest means. Long smooth straw should be selected, and made into a number of small firm bundles; these are tied together with string, and strapped very tightly on to the panels; the mat should be about an inch thick. The saddle should then be fitted with a numnah, and the portion to be removed carefully marked. About an inch beyond the portion immediately touching the sore should also be excised. Care should be taken to observe the build of the horse, so as to note in which direction the saddle is likely to gravitate when a man is on it. In one horse it may slip forwards, in another backwards. Allowance must be made for this, or else the wound may not be saved after all. It is almost needless to say that none but a *horseman* can be trusted with the fitting. The straw mats are very useful, particularly when very large numbers of horses are falling away in condition, and no other material can be procured. They are also useful when the anterior part of the channel is too narrow, and pierces the withers.

Besides relieving the part from weight, it is necessary to prevent friction as far as possible. Peters recommends that a very smooth piece of linen be carefully sewn into the numnah, and that the linen be smeared with fat or tallow, or better still, with a solution of tannin in glycerine, 1-10. The latter remedy does not become rancid like the first.

Sore Withers.—This injury is not invariably caused by direct pressure from the bridge of the saddle, but more frequently by rubbing by, or creases in the numnah. The results of the first-mentioned class are, as a rule, serious, those of the latter of less importance.

For the sake of convenience of description, Peters calls the first "sore

withers," and the second "galled withers." He points out that galled withers occur generally on one or both sides of the withers (not on the top). They occur almost invariably when the "Bock saddle" is used, in horses with a high but short wither, which rises abruptly from the back. The munnah on such a wither has a tendency to crease. The injury is generally found just under the ends of the points of the tree; it very rarely runs on to necrosis of skin, and then only through carelessness. To prevent "wither galls," Peters says it is sufficient that the numnah should be well up in the channel of the saddle in saddling; there should be room for a man's feet between the skin and the numnah.

Sore Withers.—This injury is caused generally by pressure of the bridge of the saddle on top of the wither, and is a most serious affair, as a rule. It can only occur from great emaciation of the horse, gross carelessness in fitting, or very bad riding. The structures involved may be diagnosed by the amount of pain shown; there is less flinching when the skin and muscles only are involved than when the fibrous tissues and bones are implicated; the patient will, in such cases, often tremble and perspire when the place is touched. Swelling of the lymphatics is not diagnostic of the amount of injury. It may occur from a slight gall, or from most serious injury.

Treatment.—Peters' system is to do the utmost to avoid an open pustulous wound; but if any fluctuation, whether deep or superficial, shows that serum or pus is present, he evacuates it with an aspirator. The process has to be repeated, and during the intervals cold and gentle pressure must be constantly applied.

Cases of fistulous withers should be well opened, all necrotic tissue removed as soon as possible, and careful drainage applied.

Sweat Eruption (*Schweisausschlag*).—An eczematous eruption occurs sometimes on that part of the back which is covered by the posterior part of the numnah and shabraque, but free from the pressure of the panels of the saddle. The skin is found to be tender when the saddle is removed, slightly swollen, and with a number of small vesicles. These last soon burst and pour forth a sticky fluid upon the skin, which makes it feel quite moist. If left to itself the discharge lasts two or three days, the exudate dries into crusts; these fall off in five or six days and leave the skin hairless, but smooth. The malady only appears during the hot months of the year, when the horses have undergone long, dusty marches. Peters explains the phenomenon by pointing out that the shabraque and numnah cover this part sufficiently to cause profuse perspiration, but not enough to prevent dust, etc., from covering the part and working into the orifices of the glands; that this blocking prevents the exit of the secretion by the normal channels, and the eruption is the result. He says cold applications are likely to do harm, and recommends warm water and warm solutions of soap, which will often stop the disease before it reaches the eruptive stage. When the vesicles have burst he recommends oak gall or tannin lotions.

Retention Sores (*Retentions geschwulste.*) — These are hard lumps, about as large as a hazel-nut, felt on the skin, caused by blocking of the sebaceous follicles. So long as they are not irritated they are of little importance, but if rubbed by the saddle, etc., they soon become converted into abscesses. The small recent ones can generally be removed by soap and water applications, but the larger and older ones have to undergo a suppurative process. They should be brought to a head and lanced. Fresh eruptive crops may be expected unless something is done to prevent them, and for this purpose Peters recommends washing, with soap and water, of the seat of the disease twice a week for some time after. This should be carried out as soon as the saddle is removed.

FIRST REPORT OF THE PATHO-BACTERIOLOGICAL EXPERIMENT-STATION FOR CONTAGIO-INFECTIOUS ANIMAL DISEASES OF THE STATE UNIVERSITY OF NEBRASKA, U.S.A. (FRANK S. BILLINGS, D.V.M., DIRECTOR.)

BY THOMAS BOWILL, M.R.C.V.S., ASSISTANT.

(*Continued from p.* 267.)

Diagnosis.

Peritonitis visceralis adhesiva; Enteritis tenuæ catarrhalis et hæmorrhagica; Enteritis crasus ulcerativa follicularis caseosa; Splenitis parenchymatosa; Nephritis parenchymatosa; Hepatitis parenchymatosa et degeneratio adiposa; Gastritis catarrhalis; Lymphadenitis parenchymatosa hæmorrhagica; Pleuritis effusa; Broncho-pneumonia lobularis; Myocarditis parenchymatosa; Trachietis et bronchitis catarrhalis purulenta.

Dr. Billings has also endeavoured to prepare a vaccine from pure cultures of the bacteria, but as the method is not completed to his satisfaction, I am not at liberty to mention it. Nevertheless, he has at present fifteen hogs under one year old which he has rendered immune to a virus of the first culture. Dr. Billings had no opportunity of testing the above animals by natural infection until October 27th, when a severe outbreak of Swine-plague occurred in the vicinity of Lincoln among some hogs recently imported from Iowa, among which he has placed the above-mentioned animals, and naturally awaits the result with some amount of anxiety.

This affected herd was placed at the doctor's disposal to do as he pleased, there being seventy-five hogs in it. At the present time they are dying at the rate of three or four per diem.

We have been making autopsies daily upon dead ones, and also on one or two we have killed, and found lesions in some, which go to show they must have brought the disease with them. One very acute and extremely characteristic case was at our disposal on the 26th of October, the autopsy of which offers not only some very characteristic lesions, but also in a very severe form. I have taken the liberty of bringing specimens with me, and will now describe the results of the autopsy held on a hog, October 26th, 1886. Subject, large hog about nine months old; colour, black, and in fair condition. Around the head were to be seen some tumefications, characterised by being even darker than the skin of the hog, and of a bluish-red shade. Along the abdomen were numerous dark blue-red spots, which terminated diffusely in surrounding tissue. On cutting through the skin, the paniculus adiposus was marked by numerous diffuse reddish-blue spots, and a dark blue-red fluid flowed from the cut blood-vessels. The abdominal cavity contained about two quarts of a straw-coloured fluid, in which numerous floculi floated; large intestines agglutinated together with a quantity of floculent lymph, and their surface very irregular and distended by immense masses of hard, smooth, round-shaped bodies, as large as medium-sized potatoes. The small intestines presented a diffused reddish appearance, interrupted by numerous dark red spots; peritoneum swollen, cloudy, and covered with immense numbers of bluish-red ecchymosed spots; liver greatly swollen, edges rounded, but peritoneal covering normal, and through it you could see numerous irregularly-formed yellow spots of various sizes. On cross-section of same it was seen to be of a greyish yellow-red colour, the acini being enlarged and of the same colour, though yellow predominated. The gall-ducts were distinctly visible in the interstitial tissue, which was also swollen. The gall-bladder was distended, and contained a viscid yellow fluid; spleen intensely enlarged, sixteen inches long, three and a-half wide at superior end, and a quarter of an inch at inferior end. Since this autopsy was made we have found a spleen twenty inches long and of proportionate thickness. The pulp

was disintegrated, and formed a dark bluish-red semi-fluid mass. The trabiculæ were swollen and distinctly visible through the capsule; Malpighian corpuscles enlarged and very marked; thoracic cavity (the cavity on the right side) filled with a dark red fluid, and the right lung was adherent to the ribs; both the pleuræ costalis and pulmonalis were marked with numerous ecchymosed spots, and similar spots were present on the pericardium; pericardial sac distended with a dark red fluid, and the visceral folds of the pericardium were marked by numerous dark red ecchymosed spots. The myocardium was of an opaque yellowish-grey colour, and very friable; right ventricle was distended, and the walls of the left ventricle hypertrophied. The endocardium was covered with numerous ecchymosed spots; the auricular ventricular valves shrunken and covered with numerous vegetations; bronchial lymphatic glands enlarged and juicy, the parenchyma being marked by numerous dark red spots, which gave to the cut surface of the gland an appearance somewhat resembling strawberries.

The surface of the lungs was marked by numerous dark red spots, from the size of a silver dollar to that of a pin's head, which extended beyond the surface of the lung and often corresponded to a single lobulus.

Numerous large centres of hepatisation complicated the right lung, the base being one solid mass. Smaller ones were to be found in the left lung. On one section an aqueous bloody fluid flowed from the surface of the cut lung, which presented a peculiar gelatinous, glistening appearance in some parts, while others were dry and caseous; numerous lobuli were of a dark red colour and represented hæmorrhagic infarction of bronchial origin.

Abdominal cavity.—The mesenteric lymphatic glands were swollen, and marked by numerous dark red spots, already described in regard to the bronchial glands.

Stomach.—Cardiac portion covered with numerous papillary outgrowths stained a yellow colour. The mucosa was intensely swollen with marked rugæ, half an inch in height, and on the crests of these folds were numerous follicular ulcerations. Numerous ecchymosed spots were dispersed throughout its internal surface. On approaching the pylorus the mucosa was covered with a viscid, yellow fluid.

Small intestines.—(a) Duodenum: contents were of a yellowish colour and fluid, mucosa swollen, and numerous dark red spots scattered throughout its course, with ulcerative erosions also present. (b) Jejenum was of a dark blue-red colour, resembling the so-called eel-skin of Rinderpest. (c) Ileum presented the same appearances, but Peyer's patches were swollen and marked by numerous hæmorrhagic spots.

Large intestines.—(a) Cæcum: contents of anterior part semi-fluid, and soon became hard, forming balls, which extended to the rectum. The entire mucosa of the large intestine was swollen and of a dark red colour, and marked by numerous hæmorrhagic ulcerations of various dimensions. The ileocæcal, or valve of Bauhini, was swollen and covered with petechial spots. About six inches from the valve a very large, ragged-edged, tumefied ulceration of a black red colour was to be seen, one and a half inches in diameter, having an infundibuliform character. Numerous smaller ones of a similar character extended throughout the mucosa of the large intestine.

Kidneys.—Nine inches long, three inches wide, and one and a half inches thick. On cutting through the vascular connections a large quantity of a dark red coagulated fluid oozed out. The capsules were non-adherent. The cortex was opaque, and of a pale grayish red colour, interrupted by numerous dark red spots of various sizes. Medullary substance was of a dark red colour, the vasi recti being distinctly visible. The pelvis was filled with a dark red coagulated mass, which was attached to the mucosa, the superficial and deep inguinal glands enlarged and covered with numerous black spots.

Diagnosis.

Peritonitis hæmorrhagica petechialis; Acites abdominalis; Enteritis ulcerativa hæmorrhagica; Splenitis parenchymatosa hæmorrhagica; Hepatitis parenchymatosa et degeneratio adiposa; Nephritis parenchymatosa hæmorrhagica et degeneratio adiposa; Lymphadenitis parenchymatosa generatis hæmorrhagica; Pleuritis effusa et adhesiva hæmorrhagica; Broncho-pneumonia hæmorrhagica et caseosa; Tracheitis et Bronchitis effusa et hæmorrhagica; Laryngitis ulcerativa; Pericarditis effusa et hæmorrhagica; Myocarditis parenchymatosa et degeneratio adiposa; Endocarditis hæmorrhagica et valvularis nodosa; Gastritis catarrhalis et parenchymatosa hæmorrhagica; Causus morbi; œdema pulmonum.

An examination of the blood, secretions, and tissues of this animal, gave the characteristic bacteria, which also developed in cultivations from the spleen. It should be mentioned that all of the sick hogs in the herd, from which this came, were characterized by the most obstinate constipation, and that the popular name, "Hog-cholera," is not therefore a suitable nomenclature for this disease, for which the name "Swine-plague" is much more appropriate, though that given by Klein seems to correspond more exactly to the pathological lesions. Hence, I think, that veterinarians should speak of it professionally as pneumo-enteritis suis contagiosa.

As to whether it is a contagious or infectious disease in the strict sense of the term, there is still room for some doubts, for, according to Dr. Billings' views, *a strictly contagious disease is one which has its origin, so far as we know, in an animal organism of a given species, and never outside of it; but may be transmissible from animal to animal of the same species, and in some cases to others, such as Glanders, Rabies, Syphilis. A strictly infectious disease is one found in a locality in which an animal organism has to be in or go to, in order to be infected. The infected animal cannot transmit the disease to other animals, but can carry the infectious elements in its body, and thereby infect other localities through its excretions, which may then become centres of infection to other susceptible animals, such as Texas fever, Cholera, Anthrax, Yellow fever.* There is some evidence that Swine-plague may belong to the latter class. In an autopsy made on the 28th October, 1886, we found the lesions almost entirely restricted to the organs of the thoracic cavity and the throat, with the exception of a slight swelling and redness of the mucosa of the alimentary tract, although the various lymph-glands of the abdominal cavity presented the appearance above described. The stomach, however, presented the most serious pathological lesions which we have yet seen, its walls being much thickened and extending into the cavity in deep folds. Over an inch high, on the top of these folds, and between them, were numerous ulcerations, covered with diphtheritic masses of a yellowish gray colour, and numerous hæmorrhagic centres were dispersed throughout. The same bacteria presented themselves again in this case. By your permission and hoping I am not imposing on your patience, I will now describe the method we employ to demonstrate the presence of the bacteria in hardened specimens. It is by a system of double staining as follows: You can use either gentian violet or methylia violet, but for this organism I prefer the latter. Take a small porcelain dish, fill it half full of methyl violet and an equal quantity of caustic potash 1 to 10,000 of water; both of the above must be carefully filtered to guard against germs in the same.

Take a very thin section of your tissue and put it into the above-mentioned dye for twenty-four hours. From this it goes into Gramm's solution of iodine for five or ten minutes. The solution is prepared as follows:—Distilled water one hundred per cent.; iodide of potassium one per cent., and crystals of iodine one-half per cent.; the above has the power of fixing the colour in the germs.

Now take the section and fade out until it acquires a light blue colour in one per cent. hydrochloric acid alcohol; from this the section goes into sixty per cent. alcohol, and then into an aqueous solution of eosin, and leave for about one minute. Now put it into ninety per cent. alcohol, then into absolute alcohol, and lastly into oil of cedar for examination, and you will find in a properly coloured specimen that the tissues are coloured red, and the bacteria, if present, of a deep azure blue with pale centres. In passing the section through this series of alcohols, great care must be used not to leave them immersed too long, as by so doing you will destroy the appearance of the bacteria, and render their recognition, even to an experienced eye, an impossibility.

In conclusion, there is one problem that is of great practical interest to the veterinary profession, both in this country and abroad. That is, whether the disease in England described by Klein as "Pneumo-enteritis contagiosa," and that described by Schutz of the Berlin Veterinary School, as an "Infectious pneumonia," commonly known as "schiweine seuche," and that which I have described, and is known in this country as "Hog-cholera" or "Swine-plague," are due to one and the same micro-organism; or whether these two apparently so similar organisms in their external characteristics, still differ in their pathogenic action sufficiently to account for the enterical lesions in the American disease, which Schutz does not mention having seen in Germany, though they correspond to those described by Schutz in all their chief essentials.

It must, however, be mentioned that Prof. Schutz's examinations were limited to a very small number of animals at the time they were reported. On the other hand, it may perhaps be assumed or demonstrated in the future that climatic influences have intensified the action of the micro-organism in America, and that the disease was brought to this country by imported hogs. Again, it is a well-known fact that the swine of this country and England are much finer bred than those of Germany, which ought to indicate that our swine are more susceptible to the action of the micro-organism than those of Germany, and opens a large field for future research. Dr. Billings expects shortly to be favoured with a supply of virus from Prof. Schutz, which he intends to pass through a long series of American hogs, and thus demonstrate whether the virus increases in virulence or becomes attenuated, and what lesions it produces. In two autopsies, which I made November 4, in which both animals died of Œdema pulmonum et glotidis, the lesions of the liver, kidneys, etc., were the same as usual, especially the lymphatic glands. The large intestines in both cases were free from any ulcerative lesions. There were to be seen upon the small intestine a dozen or more yellowish red and blackish spots of variable dimensions, which were hard to the touch, and on close examination of several of them, they either penetrated the serosa or approached to it. Upon cutting open the intestine, which in one case was of a pale lead colour, and in the other stained yellow, numerous round worms, from one inch to ten, and fourteen in length, were seen to be attached to these indented localities, the papilla of the parasite extending into an infundibuliform opening in the mucosa, which in all probability corresponded to the mouth of a gland or follicle, around which the tissues were swollen and indurated in a sharply circumscribed manner. Many of these places were the seat of more or less hæmorrhage; in others, which the worms had apparently left, was to be seen an umbus or circle of a greyish-yellow colour, upon which lay, and was attached, a black mass of about the size of a segment of a small pea. In the middle of the mass was a small pit or indentation which corresponded to the place where the worm had been attached. In some cases this black mass was in a process of exfoliation. These objects have the strongest if not an exact resemblance to those often seen in the

large intestine in Swine-plague, and might lead an uninitiated, unobservant, and non-reflecting person to look upon as a case of simple Pneumonia in a number of a herd of hogs in which he should observe and feel the above lesions, without at the same time making a careful examination of the contents of the intestine, or especially if the worms should be absent, as cases of Swine-plague; but an examination of the other organs, especially the lymph glands, and, above all, a microscopic examination for bacteria, would soon correct the hypothesis. It should, however, be mentioned that another essential point in the differential diagnosis between these objects and the neoplastic growth in the large intestine in swine-plague, is the tendency to, or actual penetration of, the walls of the intestine which occurs in the former and not in the latter. This experience goes to show that neoplastic and necrotic products of this circumscribed character are not peculiar to Swine-plague, and in either case are due to parasitic irritation, but it should not be forgotten that those due to the ascaridæ are invariably situated in the small and not the large intestine. Dr. Cobbold in his work on Entozoa describes this parasite as "ascaris suilla." He says it is closely related to the ascaris lumbricoides of the horse, and by some thought to be the same. Their habitat is the small intestine, sometimes in the stomach; they perforate the intestine and have been known to migrate into the cavities of the body, and also to be the cause of cystic abscesses, colic, epilepsy, and other nervous affections. They resemble the common earthworm in size; males are four to six inches long; females ten to fourteen; body marked by numerous transverse rings, attenuated toward either extremity; anterior terminating in a well-developed tripapillated mouth. Posterior in a blunt pointed tail. Female much broader than male; diameter quarter of an inch. Male has a double speculum or penis, and caudal extremity of male has an arcuate form; female organs situated towards the lower part of the anterior third, which frequently bursts after it has been placed in water.

I wish here to publicly express my thanks to Dr. Billings for his kindness and unselfishness in allowing me the use of his records of experiments, autopsies, and other articles necessary for the compilation of this paper, especially as it is rather rare for an original investigator to allow his assistant to have the honour of making the first publication of his work.

The Doctor authorised me to say that he himself will make no publication until the work is completed, including the pathology of the disease. And, now, gentlemen, I wish to thank you for the patience with which you have listened to my somewhat lengthy paper.

Reviews.

A Treatise on the Diseases of the Ox; being a Manual of Bovine Pathology. By J. H. Steel, M.R.C.V.S., A.V.D. Second edition. (London: Longmans, Green, and Co. 1887.)

A new edition of Mr. Steel's well-known and most useful work on bovine diseases, has enabled him not only to correct the trifling inaccuracies which existed in the first edition, which was issued only six years ago, but to bring its contents up to the requirements of the present day. In the comparatively brief interval which has elapsed, great advance has been made in general pathology, as well as in the pathology of certain maladies to which cattle are liable, and these new views and facts have all been duly re-

gistered by Mr. Steel, who has made his book the most complete on the subject of any published in English, or perhaps any other language. For the student, no less than for the busy practitioner, the work deserves the strongest recommendation because of this completeness, the careful descriptions, and the explanatory and numerous illustrations.

THE FARMER'S VETERINARY ADVISER: A GUIDE TO THE PREVENTION AND TREATMENT OF DISEASE IN DOMESTIC ANIMALS. By J. LAW, F.R.C.V.S. (Edinburgh: Thomas C. Jack.)

When this work was issued some years ago we had great pleasure in reviewing it, and expressing a very favourable opinion of its merits. The able Professor of Veterinary medicine in Cornell University had given farmers a most valuable handbook of the diseases and injuries to which their animals are liable, with details as to appropriate treatment. We cannot discover whether the work before us is a new edition, or merely a reprint in this country, but conclude it is the latter, as there is apparently no alteration or improvement in the text, the advances made in our knowledge of some of the maladies—as Anthrax—since the book was issued in America, being unnoticed. Nevertheless, the "Adviser" possesses all the merits which should be found in such a production, and which we have already pointed out in our notice of the first edition.

IBID. Eighth Edition. (Ithaca: Published by the Author. 1887.)

This is the eighth edition of the above work published in America, and in every way it is worthy of the reputation of its distinguished author. Unlike the edition just published in Edinburgh, this comprises all novelties with regard to diseases of the domestic animals up to the commencement of the present year, and is about as complete as such a manual could well be. There are many illustrations, and the descriptions, if brief, are clear and simple. For veterinary and agricultural students, and even for veterinary practitioners, the volume may well serve as a text-book and guide.

PLANTS REPUTED POISONOUS AND INJURIOUS TO STOCK. By F. M. BAILEY, F.L.S., and P. R. GORDON. (Brisbane: J. C. Beal. 1887.)

Queensland, like nearly all our other Australasian colonies, is, to a large extent, a stock-raising colony, and great attention is devoted to keeping the cattle and sheep free from diseases, either contagious or due to food, water, or other causes. The immense tracts of pasture land on which the herds and flocks feed contain many plants besides those which may be classed as food plants, and many of them are either poisonous to stock, or injurious from their indigestibility. Mr. Bailey, who is the Colonial Botanist, and Mr. Gordon, Chief Inspector of Stock, set themselves the task of classifying in a brief account these deleterious plants, and have published the result of their labour in a handy volume. The plants referred to are described in a popular manner, and an excellent full-page lithograph is given of each to facilitate identification. These drawings are by Miss Hope, and strike us as being well executed. The

manner in which the book has been produced does credit not only to the authors but to the colony, and we may add that it has been printed by authority of the Honourable the Colonial Secretary.

TABLES OF VETERINARY POSOLOGY AND THERAPEUTICS. By G. A. BANHAM, F.R.C.V.S. (London: Baillière, Tindall, and Cox. 1887.)

In a neat little book, which could almost be carried in the waistcoat pocket, Mr. Banham has contrived to include a great amount of useful information relating to veterinary posology and therapeutics, and tables of weights, measures, those for regulating the doses of medicines for young animals, as well as a table of officinal and veterinary formulæ, one of the general classification of medicines according to their influence on the organs and structures of the body, one of agents arranged according to their therapeutical action, one of diseases and their remedies, one of solubility of drugs, one of thermometry, one of utero-gestation, and one of dentition. Mr. Banham's well-known skill and care are a sufficient guaranty of the correctness of the contents of the wonderful booklet, which is really *multum in parvo*, and must have cost him much time and labour in selecting, condensing, and arranging his materials. It will be found of great value in the pharmacy and in every-day practice.

THE HORSE, COW, AND DOG, WITH ANIMAL CHARACTERISTICS. HINTS ON THE BREEDING AND REARING OF FARM ANIMALS. By T. WALLEY. (Edinburgh: Turnbull and Spears. 1887.)

These two little productions by the principal of the Dick Veterinary College do not need much notice. The rhymes on the horse, cow and dog come scarcely within our line of criticism, and even if they did we fear we could not say much for them. We are reminded of Androcles and his leonine attendant by a few lines commencing—

> "A lion in his foot did get
> A cruel thorn, which made him fret
> And *hobble* very sore."

The horse's troublous life begins—

> "A long-legged, guileless colt
> My mother brought me forth upon the
> Grampian hills."

which again reminds us of Home's tragedy of Douglas—

> "My name is Norval, on the Grampian hills," etc.

The cow proclaims—

> "A harmless, innocent, and lively calf,
> I first saw light near Winder's classic lake;
> And as I played around my loving dam,
> I thought not of the troublous time
> That, far ahead, for me did stretch.
> For just five years I passed a quiet life,
> Fulfilling all the duties that do appertain
> To female members of the bovine race."

while the dog volunteers the statement—

> "A rolly, poly, helpless little lump,
> I first heard worldly sound in Edin's classic town,
> And after nestling close in bed, so soft and warm,
> In just nine days I did my sight obtain;
> And then with eyes amazed I glanced around,
> And saw the wondrous form of her who gave me birth."

The animal characteristics are included in a lecture delivered at the Leith Sailors' Home, and are more acceptable and understandable than the poetry, which leaves us in a rather indefinable state of mind.

In the other little work, Professor Walley shows that he is more at home in the farm-yard than on Mount Parnassus, where his animals relate their history in such extraordinary language and string-halty rhyme. It consists mainly of a paper read at the Fife Farmer's Club, on the breeding and rearing of animals, and contains much which breeders and rearers of stock should store up in their memory and apply in their vocation.

Proceedings of Veterinary Medical Societies, &c.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF COUNCIL, HELD OCTOBER 12TH, 1887.

Sir HENRY SIMPSON, President, in the chair.

Present:—Professors Brown, C.B., Duguid, McCall, Pritchard, Robertson, Walley, Williams; Dr. Fleming, C.B.; Messrs. T. Briggs, R. Cartledge, T. Campbell, J. S. Carter, J. Roalfe Cox, E. C. Dray, T. Greaves, W. F. Mulvey, J. F. Simpson, T. Taylor, F. W. Wragg, W. Whittle, W. Woods, and the Secretary.

The SECRETARY read the notice convening the meeting.

The minutes of the previous meeting were taken as read.

The SECRETARY read letters from Sir Frederick Fitzwygram and Mr. Simcocks regretting their inability to attend.

The SECRETARY announced that "The Calendar of the Durham College of Science" had been received as a donation to the library.

A vote of thanks was passed to Mr. James Blakeway, of Stourbridge, for the gift to the College of a cow's heart showing Pericarditis to an extraordinary extent.

The SECRETARY announced that a letter had been received from a gentleman who was desirous of coming up for his Fellowship again. He came up in 1883 and was rejected. He paid his entrance fee of five guineas, and he wanted to know whether he could come up again without any entrance fee.

It was agreed that this gentleman should be allowed to come up on payment of his fee, and being recommended in the usual way.

Another letter was read from a graduate of Columbia Veterinary College, asking whether the diplomas of that College were recognised by the Royal College of Veterinary Surgeons, England.

Professor WALLEY said he had had applications from various colleges in America and Canada, and he thought it was high time that it should be determined what colleges were to be recognised.

Professor WILLIAMS moved that a committee consisting of the President, Professor Robertson, and Dr. Fleming, should be appointed to consider the

question of what colleges should be recognised by the Royal College, and that this application should be referred to that Committee.

Professor McCALL seconded the motion, which was carried.

Professor WALLEY asked what course had been taken in regard to his letter containing a resolution that in the future in the Scotch schools there should only be two examinations every year instead of three.

The PRESIDENT said that the matter was dealt with in the report of the Examination Committee. It was decided that it should be referred to that quarterly meeting, but in consequence of the expeditious manner the Committee had performed its work, he (the President) thought that no further action would be necessary in regard to the letter.

Mr. J. F. SIMPSON asked whether the recommendation of the Committee which was presented to the Council on the 14th of June had been forwarded to the Lord Provost of Edinburgh, and if any reply had been received.

The SECRETARY said that the letter was sent.

The letter containing the resolution of the Council was then read as follows:—

"In considering the report from the Trustees of the Dick College, dated 25th March, 1887, and the Chief Constable's report of the 24th February, 1887, with reference to the veterinary students' disturbance in Edinburgh on the 14th and 15th January last, and the evidence adduced in support of their statement, also having regard to the importance of a settlement of the matter in dispute, the Committee recommend 'That a Court of Inquiry be appointed consisting of representatives from the Trustees of the Dick Veterinary College and the Council of the Royal College of Veterinary Surgeons—an equal number on either side.' The Committee suggest that no member of the Court of Examiners or person connected with either of the schools be appointed to act on this Court of Inquiry."

The PRESIDENT announced that as yet no answer had been received to that communication.

Report from the Court of Examiners.

The SECRETARY read the report and the result of the examinations in Edinburgh.

Mr. DRAY moved its adoption.

Mr. WRAGG seconded.

Professor WALLEY moved that it be not adopted. They must be all perfectly aware that in Scotland they were desirous of having only one or two examinations in the year, at Christmas, and in May. If the recommendations in this report were adopted, it meant that a man who was relegated in May for nine months would not be able to come up again until the following May, so that the examinations would be put off indefinitely, and the curriculum prolonged. He thought it was hard students should be relegated for so long a period. He remarked that some of the men who had received "bad" marks at each examination were put in the same category with men who had received "sufficients," and some even "goods." He thought that alone was one reason why these recommendations should not be carried out. He thought there had already been a sufficient number of relegations, and that it was time the students were given a chance. He moved as an amendment, "That the part of the report which refers to the relegation of students be not adopted."

Mr. GREAVES seconded.

Dr. FLEMING said that the terms of the recommendation were that the relegations should be for a term of not less than nine months. The Examiners had taken the whole matter into their most serious consideration.

Professor WILLIAMS said he regretted very much that the Board of Examiners had taken such a position in regard to these relegations. It did

not apply to Scotland alone, and he would be very glad indeed to see the rule expunged altogether.

Professor PRITCHARD thought that it could not amount to relegation if the students were allowed to go up for the next examination. They thought they were dealing leniently with them in only giving them nine months.

Professor MCCALL suggested that Professor Walley should withdraw his amendment, as it was a pity to divide the Council on this question.

Professor WALLEY considered that circumstances did not justify him in taking that course.

Professor PRITCHARD thought it was easy to explain why a student got a "sufficient" or even a "good" in a subject at one examination, and then a "bad" in that subject at the next. Everyone who was acquainted with examination would know that it was only natural that when a student had obtained a "good" or a "sufficient" in one subject and had failed in another, he should leave the subject in which he had obtained a "sufficient" or a "good" in order to study the other subject.

The following amendment, being the previous amendment with verbal alterations, "That the Report of the Court of Examiners be adopted, except that the students be relegated to January, instead of nine months," was then put.

Six voted for the amendment and eleven against. It was therefore lost by a majority of five.

The original resolution was then put, "That the Report of the Court of Examiners be adopted," seven voting in its favour, and three against, being carried by a majority of four.

The SECRETARY announced that there was various correspondence which it was agreed should be referred to the Registration Committee.

Complaints had been received that a person practising in London had recently described himself as a licentiate of the Royal College of Veterinary Surgeons, when before the Lords' Committee on Rabies.

It was moved and carried, "That the solicitor be instructed to satisfy himself that the person did so report himself, and if he is satisfied to take proceedings."

Finance Committee.

The SECRETARY read the report.

Mr. DRAY said that the Committee thought that it was high time some action should be taken with regard to their finances, and proposed that only 200 copies of the "Register" should be printed.

Mr. TAYLOR moved that only 200 copies should be printed.

The motion was seconded by Mr. CARTER and carried.

The PRESIDENT said that he had intended to make a recommendation that, between the present time and the next quarterly meeting in January, the Finance Committee should take up the whole subject of finance, tabulating their ordinary income and expenditure, and their extraordinary income and expenditure. One of the questions also to which they should turn their special attention should be the extinction of the College debt. It would be a good thing for the Council to authorise the Financial Committee to prepare a special report, to be presented to the Council in January next.

It was moved by Mr. DRAY and seconded by Mr. TAYLOR, "That the Finance Committee be requested to undertake the examination of the finances of the College, and make a special report in the month of January."

The motion was carried.

Mr. DRAY moved the adoption of the Financial Report, and that cheques should be drawn to meet their liabilities.

Mr. WRAGG seconded the motion, which was carried.

Obituary.

The SECRETARY read the Obituary List.

Mr. DRAY moved that a vote of condolence and sympathy should be sent to the family of Mr. Mayer, who was a well-known and distinguished member of their profession.

Professor ROBERTSON seconded the motion, which was carried.

The PRESIDENT said he could not allow the opportunity to pass without adding this information, that Mr. Mayer was the first who had subscribed to the fund for building their present College.

Examinations Committee.

The SECRETARY read the Report of the Examinations Committee, as also a letter of Professor Walley's, in reference to the Scotch examinations.

Professor WALLEY complained that all his questions had not been satisfactorily answered.

The PRESIDENT, in answer to Professor Walley, said he thought he was right in saying that there was no power to anyone to demand admission to the examining room.

Professor WALLEY asked whether, according to the Report, teachers in the future would not be allowed into the examining room, as they had hitherto been allowed to do so.

The PRESIDENT replied that they had no power, but as an act of courtesy and favour the Examiners did invite them.

Mr. TAYLOR then moved, "That the Report be adopted."

Dr. FLEMING seconded the motion, which was adopted.

Professor WILLIAMS moved the following resolution, based on a paragraph in the Report:—"That the question of the inspection and the legality or right of individual members of Council to refer to the books of the Council at any time be referred to the Solicitor."

The amendment was put to the meeting and carried.

The New Rules of Examinations.

The discussion of the proposed New Rules of Examinations as agreed to by the Examination Council was then proceeded with, copies having been printed and forwarded to the Council some days previously.

The Rules for the General Examination were all passed with verbal alterations.

On the Rules for the Professional Examinations being discussed, Rules 1 and 2 were passed.

Rule 3 was passed as follows: "There shall be not less than two Examiners at each table."

Rules 4 and 5 were passed with slight alterations.

Rule 6, after a long discussion, was passed as follows: "At the Final Examination a student shall be examined in Morbid Anatomy and Pathology (one table, two Examiners). Diseases of the Horse, including Veterinary Medicine, Surgery, Therapeutics, Materia Medica, and Toxicology (one table, two Examiners). Diseases of the other domesticated animals, including Veterinary Medicine, Surgery, and Therapeutics (one table, two Examiners). He shall also undergo a general practical examination in regard to horses, in writing certificates and prescriptions, and in dispensing medicines, before two Examiners; likewise undergo a similar examination with regard to the other domesticated animals, before two Examiners."

Professor MCCALL moved the following: "That the final or C Examining Board shall consist of two sections, the first to conduct the Oral, and the second the Practical, and that their awards be disjoined. Each student who

has successfully passed the Oral sections shall be allowed to present himself for the Practical, but should he fail in the Practical it shall be optional on his part to remain at college or to engage in practice during the interval betwixt his rejection and the following examination, but in every such case the student shall produce a certificate signed by the member of the Royal College of Veterinary Surgeons with whom he has practised, and it shall also be attested by the Principal of the College with whom he has studied." By the regulation they were seeking to pass in Rule 6, five Boards of Examiners would be constituted, six Examiners conducting the Oral and Theoretical, and four conducting the Practical. He thought it would be a very difficult matter indeed for the students to satisfy all these. What his proposal embodied was that a student, having passed successfully a difficult examination in the Oral and Theoretical subjects, should then be allowed to pass on to his Practical, and should he fail in that, that he might either remain at college for further instruction, or that he might go out and engage in practice with a practitioner, a member of the Royal College of Veterinary Surgeons. He had consulted a great many on the subject, and the bulk of them agreed with him.

Professor WILLIAMS seconded the amendment. He thought such a change as was proposed would add greatly to the welfare and prosperity of the veterinary profession. He felt quite convinced that they would have better practical men if they adopted that system of examinations.

Mr. J. F. SIMPSON said that now we had an admission by the representatives of the schools that the veterinary surgeon was capable of importing practical knowledge to a pupil. Compulsory pupilage before entering the colleges had been condemned, but the suggested change in the rule was nothing more nor less than compulsory pupilage at the wrong end; if young men could not obtain sufficient practical knowledge at the schools to enable them to satisfy the Examiners he was opposed to asking them to seek it at the end of their terms of college study, far better that they should see practice before entering the school. He should oppose the proposed change.

Professor BROWN said that the matter had come before the Committee of Inquiry, who had gone into it and found that there was something to be said in its favour, and something against it, and had the Committee thought it desirable to adopt that section they would have failed to recommend it instead of the present rule.

Dr. FLEMING said he was entirely averse to the breaking up of the examinations. The great fault of the students of the present time was that as soon as they had passed their examinations they had done with the subjects. Pupils came to him who knew scarcely anything about anatomy. He thought that by splitting up the examination they would be opening a way for letting inferior men into the profession.

Professor BROWN said that it crossed his mind in listening to the statements of several gentlemen, that students, even if they forgot the theoretical part of the examination before they came up for the practical, would have many means during the few months they were in practice of refreshing their memory somewhat, and even if they forgot it altogether, was it not the wisest plan to adopt the best conceivable way of making them the best practical men? The practical men would in the future take the place of the theoretical, and he was compelled under the present circumstances to adopt the somewhat humiliating course of recommending practical teaching to the almost utter exclusion of theoretical teaching.

Mr. J. ROALFE COX said that after hearing the proposed alterations in the course of the final examinations for the diploma, he found that his interest in the profession he had endeavoured creditably to represent during nearly

forty years, warranted him in urging his opinion upon the consideration of the Council. He believed that the separation of the Practical from the final Oral examination in the way proposed would be most disastrous to the profession, as well as to the interests of the students. During the first year of such a course there might be two or three hundred or more young men cast on their own resources to seek opportunities of practice and practical instruction where they might. The schools being no longer under the obligation to provide them, he would like to ask where were there two or three hundred or more practitioners to meet this requirement? Each year would be multiplying the number thus thrown adrift to the utter wreck and ruin of their prospects in the profession in which they were embarked. The result of the course proposed could not be otherwise than to drag down their profession more and more in public estimation. It would also be disastrous to the schools and their interests in the long run, since, once released from the obligation to provide sufficient practical instruction, efforts would relax more and more, and prestige would proportionately suffer. If there needed further argument against separating the examinations for the diploma, they had it in the declaration of one professor who was present, and in the fact being endorsed by a second, that a pupil forgot in six months the subject in which he had once passed, and therefore it would be unfair to call on him a second time. It was urged as a reason for his being allowed to pass the Oral first, and then being released to prepare for the Practical, with the remark that if again he was examined in the Oral he would most likely fail. If that were the case he should like to ask the good of the examinations and the teaching at all. It was but human nature for them to consult their individual interests, and as with their friends now associated with the schools and teaching so would it be with any of them in their place. As the requirements of the examinations so would be the teaching. If by the direction of the "powers that be" the examination was fixed at "K," they might depend upon it that the teaching and study would never be set at "Q." It should not be dragged down, gagged, and emasculated to assimilate with the views and convenience of the teachers and their class. Withdraw the obligation on the schools to provide the necessary practice and practical training, and why should not fresh enterprise crop up in teaching? Why not schools of economic principles and reduced fees with an indoor clinique and practical class:—four walls and an upper story could house and stable the subjects for the practical work. A rocking horse, a stuffed dog, a chalk cow from the dairyman's window, and a woolly sheep on four wheels crying "Bah" on someone squeezing its stomach, might answer the requirements, but they would not be making veterinary surgeons in that way; they would not be maintaining their little hold on public recognition, nor would they be retarding the possible day when that building, now the Royal College, might become a parcels office for the Midland Railway. If they retrograded now they were lost. He viewed the position very seriously, as well as the contemplated changes. If the Practical examination had to be separated from the final Oral, then by all means let them take the Practical first, and until that had been passed defer the other, but he thought it was far better to have the two taken together.

Professor PRITCHARD said he gathered from the discussion that it was admitted all round that the man who passed the Oral would go into the country, and by the time he came back would have forgotten all about it. He would like to know what kind of a practical examination the student was likely to pass who had been in the country or elsewhere and totally forgotten the scientific portions of his examinations.

Mr. CAMPBELL supported Professor McCall's motion, which was then put and carried by a majority of two, 11 in its favour and 9 against.

It was agreed that the new rule should be numbered *pro tem* 6A.

Rules 7 and 8 were passed.

Rule 9 was, after discussion, passed as follows:—The President will be expected to attend the examinations once at least in the year at London, Edinburgh, and Glasgow.

Rules 10, 11, 12, and 13 were passed.

Rule 14 was expunged.

Rule 15 was passed, and Rule 16 also, with verbal alterations.

Rule 17 Professor McCall withdrew; an amendment to the rule was passed.

Rule 18 was passed with verbal alterations.

Rule 19 was passed as follows:—An Examiner in any one class shall not examine in any other; and in the final the Oral Examiners shall not examine in the Practical.

Rule 20, with verbal alterations, was passed.

Rules 21 and 22 were passed, and the discussion closed after a protracted sitting.

It was then moved and carried that the new rules now agreed on be suspended in the Board Room for three calendar months as required by the charter.

Mr. GREAVES gave notice of a motion for the next quarterly meeting.

Professor WALLEY proposed, and Mr. Woods seconded, a vote of thanks to the Chairman, which was agreed to.

ROYAL VETERINARY COLLEGE.

THE winter session commenced on October 2nd, Earl Spencer, K.G., occupying the chair during the proceedings.

There was an unusually large attendance, amongst those present being:—Lord A. Somerset, Colonel Allsop, Sir Jas. Tyler, Mr. Harpley, Dr. Fleming, C.B., Sir Henry Simpson, P.R.C.V.S., Professors Simonds and Pritchard, Professor Brown, C.B., and the whole of the Educational Staff.

The PRINCIPAL said: Acting upon the privilege we possess and which we value much, I have great pleasure in calling upon one of the Governors of this Institution to preside to-day. This nobleman requires no introductory remarks from me so as to secure for him a most hearty welcome, for the name of Earl Spencer is well known to the present generation of Englishmen in connection with many departments of national life and work, and not least with agriculture and with social science—departments which are more closely related to us as professional men than many others.

The CHAIRMAN, who was received with loud applause, said: As I shall have to trouble you later on with some remarks, I only rise now, on taking the chair, for the purpose of introducing to you the lecturer, Professor Lowne, who will deliver the introductory address.

The PROFESSOR said: My Lord, Mr. Principal, My Lords and Gentlemen,—I do not doubt that I may offer to your lordship the thanks of all connected with this College for your presence here to-day. By thus honouring us, you make us more than ever proud of this College; nor are we unmindful of the great benefits conferred by it on the veterinary profession and the public, nor of those arising from the more extended study of general pathology, in which all researches into the causation and symptoms of epizootic diseases not only confer an indirect benefit on the human race, by saving the lives of those animals which are so valuable to us, but also confer a direct benefit, for such researches tend strongly to increase our knowledge of the causation of human ailments.

When, by the favour of my colleagues, the honour of addressing you to-day was conferred upon me, I felt it incumbent that I should study carefully the history of this College, and the relations, past and present, of the medical and veterinary professions. For it occurred to me that it is just one hundred years since M. Vial St. Bel first visited England, and just one hundred years since the action commenced which I think I may say led to such a representative gathering as that which I have before me to-day, and to such a great boon to our country as this College affords. I do not speak lightly in saying this, for I think all will readily admit that the rise and progress of scientific veterinary practice in this country has been exceedingly rapid, and that the benefits accruing to the general and agricultural community have been proportionately great—greater than could have been reasonably expected when the condition of veterinary science, if it could be called science, in England, a hundred years ago, is taken into consideration, and greater than could be expected when the natural opposition of those who considered themselves competent to treat the diseases of animals, and the general want of knowledge on the part of the public, are taken into consideration.

The farrier, *ferrarius*, iron-smith, or shoer of horses, raised his voice against the innovation, secure as he then thought himself, in his innate knowledge, or rather want of knowledge, confident in his empiricism, and trusting to the ignorance and credulity of his employers. Scientific methods were stigmatised by him as theories, for which he had the contempt of ignorance, and theories in the minds of his patrons had no better reputation than hearsay. Yet I would venture to affirm that a man without a theory is like a mariner without a compass. To quote the weighty words of our Principal, "Theoretical knowledge renders the attainment, when opportunity offers, of sound practical information much easier, and clears the way of many difficulties;" and I would add that, in the bye-paths of science he who is without theory to guide him wanders aimlessly, and often ends where he begins. Even a bad theory is often better than none—it may be but a feeble light, but it is better than absolute darkness.

But to return from this digression. Amongst those who, seeing far into the future, initiated the movement which led to the foundation of our College, there is one name at least which was in itself more than enough to ensure success—a man who at that time was far less known and appreciated than his genius deserved, but whose memory is revered, whose work is now admitted by all to have been pre-eminent—the immortal John Hunter. That great man, that great light amongst men, found the time, in spite of failing health, even when he was most occupied in the active exercise of his profession, to urge the cause of M. Vial St. Bel. Mindful of the urgent necessity for such an institution as this, he directed his great genius in the cause of veterinary science towards the foundation of this College. That such a man should have exerted himself for our welfare must be regarded by all, the youngest as well as the oldest amongst us to-day, as an honour indeed.

With such a mighty spirit moving amongst the founders of our College success was inevitable. John Hunter was a large-hearted man, and I doubt not many large-hearted men were associated with him in so good a cause. The noble charger that champs the bit in the battle-field, the delicate thoroughbred, the hunter, petted alike by his generous master and his fair mistress, the patient oxen, and all the dumb domestic friends of man, appealed, mutely it is true, but no less forcibly, to the kind hearts of those who believed that such an institution as this was needed; and the founders of our College stood nobly by it, through long years—years of disappointment and opposition—but they were strong in their belief, and, as with all who are determined to succeed, success has crowned their work.

I will pass rapidly over the early troubles of this College which followed

the premature death of your first professor, M. Vial St. Bel—a man who had clearly many of the attributes leading to the highest success—troubles which, to use the words of England's greatest poet—

> "Were naught else
> But the protractive trials of great Jove,
> To find persistive constancy in men,
> The fineness of which metal is not found
> In fortune's love; for then the bold and coward,
> The wise and fool, the artist and unread,
> The hard and soft, seem all affixed and kin;
> But in the wind and tempest of her frown,
> Distinction with a broad and powerful fan
> Puffing at all, winnows the light away,
> And what hath mass and matter by itself,
> Lies rich in virtue and unmingled."

My lord, it is with pride that I speak of the next period in the history of this College, because it was by the genius, genial bearing, and perseverance of Professor Coleman, a member of my own profession, that your great enterprise advanced in public estimation and usefulness. He would, I opine, be an ungrateful and prejudiced man who, looking back on the past, would side with those who, in my humble opinion, were the enemies of the true cause, and who with little grace endeavoured to impute unworthiness to one who worked well and worked with a will for many years towards the advancement of veterinary science in this country—one who, even on the showing of his severest critics and enemies, was well beloved by his pupils.

To my mind it is inconceivable that petty jealousies should have arisen between two sister professions so knit together in a common cause, so unlikely to clash in interests, as the medical and veterinary, for are not the general principles of pathology all-important to both? Must not each profit largely by the work of the other?

As the barber gave up all claim to medical and surgical knowledge, except the insignia of his office, the bleeding staff, fillet, and basin, the very meaning of which are unknown except to the few, long before the claims of the shoeing-smith, *ferrarius*, or worker in iron, corrupted to farrier, were laid aside, it was natural and right that the elder profession should assist the younger. And as there are still many sciences which are far more advanced with those of my own profession, possibly from the greater number and greater leisure of her votaries, it is still right that they should, as far as possible, assist to their utmost a cause which is undoubtedly of the highest utility, and one which does honour to humanity.

I take it that one and not one of the least benefits, conferred upon the veterinary profession by this College, is the intimate and cordial relationship of your medical and veterinary professors. Nor are the benefits one-sided, for we of the medical learn much from those of the sister profession. In pathology there are rich stores of information ready to our hands, and if we neglected the opportunities which their work affords, the loss and blame would be ours.

In Germany the relations of the two professions have long been most intimate, and it is doubtless true that Germany is in advance of us, not only in this, but in many things connected with science and its application to practical work. But of late, I am happy to say, we have followed more closely the good example of our Continental *confrères*.

In passing I would, my lord, with your permission, address a few words more, especially to those who are now entering upon a course of study in these walls, and to those who are already students in our College. I would remind them that the time is passed when they have no other duties than the

mere earning of bread. They have serious responsibilities thrown upon them, both in the maintenance of the dignity of a profession, and the acquirement of the necessary scientific and practical knowledge for the proper treatment of their dumb patients.

The dignity of their profession requires that they should distinguish themselves by a gentlemanly bearing and courtesty of manner to all with whom they come in contact, added to which they should be studious and attentive, and, above all things, lose no opportunity of cultivating their powers of observation. To be a good observer is the only road to success in veterinary practice.

The cultivation of the power of careful observation is, I regret to say, greatly neglected in the ordinary education of a youth in this country. Even at our best public schools no attempt is made to cultivate the powers of observation. In this College, however, no such failing exists. Very wisely, I think, every opportunity is afforded to the younger pupils of cultivating a power of observation; their observant faculties are quickened by the study of botany, both in the field and the class-room. Perhaps some may say, or think, I am like the saddler, who asserts that there is nothing like leather; but, seriously, I know of no science which affords a better training for the powers of observation. It is by the ready appreciation of minute differences that the veterinary surgeon succeeds—minute deviations from health—and it is by the study of differences of gradually increasing difficulty that the botanist first learns to distinguish a group of plants—as, for example, the grasses from all others; and then, by more and more careful examination, one grass from another. The more complex and more difficult study of anatomy follows; and, lastly, the crowning work—the study of the symptoms by which various diseases differ.

To such subjects instruction in chemistry and the use of the microscope in pathological investigations are added, and these are all-important in their bearing on the after-life of the student; he learns dexterity in maniulation, and increases his power of grasping facts and scientific methods.

It is in the inculcation of care in investigation—accuracy of observation more than the mere committal of facts to memory—that such a course of instruction is valuable. It matters little that the facts themselves are often soon forgotten; the mental training which has resulted is invaluable in after-life.

I think, my lord, I have said enough to convince those who are about to enter the profession that a career of studious habits and the assiduous cultivation of a power of observation are all-important, and would add that if any amongst those who sit to-day for the first time in this theatre are doubtful of the serious duties they are undertaking—if there be such, it were better they applied themselves to some other line of life, for I believe the time is rapidly approaching, if it has not already arrived, when such as fail in a steady application to their work here, and in that dignity of conduct which is the sure mark of a gentleman, will fail to succeed in the veterinary profession.

My lord, there are other matters of the most vital importance which I would ask your leave to touch upon. Our knowledge of the causation and prevention of contagious epizootic disease has recently made great strides. The discovery of the existence of all prevading organisms—microbes, as they are called in scientific language—better known, perhaps, as bacteria, bacilli, or germs, and the potency of these for harm, both to man and animals, has thrown a new light upon contagious epidemics and epizootics.

I need hardly remind you of the doubts which still perplex the minds of scientific men, for although the general principle may be said to be firmly established that contagious diseases generally are the result of the invasion of the living body and the multiplication within it of minute parasitic organisms, there is still doubt in the case of many diseases how far these agencies

are at work; and although prevention is possible in some cases, at least, by a kind of vaccination or inoculation, either by modified or attenuated virus—that is, by fluids containing the parasitic organisms in a particular state or condition—the extent and nature of the protection afforded by such treatment is in many cases doubtful, whilst the methods are still open to various modifications.

It is obvious that such matters can only be set at rest by prolonged and careful experiments, extending over long periods of time. I am aware that such experiments have been recently carried out by our Principal and his staff, and that a distinguished German, Professor Schutz, has been working in our laboratory. But there is less activity in forwarding knowledge by such methods in this country than could be desired.

Lack of money set aside for such purposes is one of the causes of this. We are satisfied with spending £100 or £200 from time to time. In Berlin, on the other hand, no less than 250,000 marks, or about £12,500 a year, are granted to the veterinary college for such purposes, whilst in America large sums have been expended in work of this kind for the last ten years or more. Our own apathy and carelessness, to use no harsher term, is not worthy of the richest country in the world, and whnre such great monetary interests are at stake to take no higher ground is simply incomprehensible and much to be regretted.

There is also another check upon original research in this country—legislative interference, the so-called Vivisection Act. This Act, however well meant, is, in my humble opinion, much to be deplored, as great difficulties are thrown in the way of all experimenters—difficulties which can only be overcome partially by a few men of known scientific reputation, and not even by some of these; so that original research into the causes of disease is seriously crippled in this country, where its usefulness is manifest, and where the interests of both man and the animals around him are paramount. Thousands of animals perish from such diseases as Anthrax, Rabies, Diphtheria, Consumption, and similar epizootics; man himself forms a victim to similar epidemics, and yet such a mistaken policy throws every obstacle in the way of those who would fight the good fight against disease and death, even at times at the imminent risk of their own lives.

The address was frequently greeted with applause.

The CHAIRMAN, again rising, said: The task which I have to perform is, I am sure, a very easy one; it is to return thanks to Professor Lowne for the very interesting, eloquent, and able address which we have just heard from him. He has touched on many subjects of great importance. I need not go into them now, but I fully endorse the general views which he has so ably placed before you. I think you will all agree with me in giving him our most hearty thanks for the very able and instructive address which he has just delivered.

The PRINCIPAL then read the prize list for the past session as follows:—

LIST OF MEDALS, CLASS PRIZES, ETC, AWARDED AT THE OPENING OF THE WINTER SESSION, 1887-88.

COLEMAN PRIZES.

Silver Medal	Mr. T. A. T. Hutton.
Bronze Medal	Mr. W. A. Dellagana.
Certificate of Merit	Mr. S. B. Baker.

CATTLE PATHOLOGY PRIZES.

Silver Medal	Mr. T. A. T. Hutton.
Certificate of Merit	Mr. E. R. McHugh.

SCHOLARSHIP.

£25 per Annum for Two Years	Mr. E. E. Martin.
Highly Commended	Mr. F. W. Greenlaw.

CLASS PRIZES.

Class C.

Hippopathology	Mr. J. A. W. Dollar. Mr. W. M. Reeman.
Cattle Pathology	Mr. E. R. McHugh.
Morbid Anatomy	Mr. E. R. McHugh.
Helminthology	Mr. J. A. W. Dollar.
Therapeutics	Mr. A. E. Branch.

Class B.

Anatomy	Mr. R. W. Knowles. Mr. W. H. Brooke.
Histology	Mr. W. A. Byrne.
Physiology	Mr. W. A. Byrne.

Class A.

Chemistry and Toxicology ..	Mr. E. E. Martin.
Materia Medica	Mr. A. J. Seath.
Practical Chemistry	Mr. E. E. Martin.
Botany	Mr. E. E. Martin.

CERTIFICATES AWARDED OCTOBER 3rd, 1887.

CLINICAL CLERKS.

Mr. Arnald, H. B.	Mr. Goodliff, G.	Mr. Moore, A.
Mr. Baker, S. B.	Mr. Goodwin, H.	Mr. Newsome, A. C.
Mr. Barcham, T. E.	Mr. Hall, H.	Mr. Patrick, W. G.
Mr. Beckford, T. L.	Mr. Healy, J.	Mr. Pettifer, T. V.
Mr. Branch. A. E.	Mr. Hutton, T. A. T.	Mr. Reeman, W. M.
Mr. Clarke, R. W.	Mr. King, H.	Mr. Sangster, A. E.
Mr. Clifford, W. A.	Mr. Legg, J. A.	Mr. Stidston, T. H.
Mr. Dellagana, W. A.	Mr. Lucking, T.	Mr. Watchorn, F. W.
Mr. Dollar, J. A. W.	Mr. Maccormack, H. A.	Mr. Wharam, S.
Mr. Exley, T. B.	Mr. McHugh, E. R.	Mr. Wilson, W. T.

MONITORS.

Mr. Barcham, T. E.	Mr. Goodwin, H.	Mr. Maccormack, H. A.
Mr. Bates, J. H.	Mr. Healy, J.	Mr. Moore, A.
Mr. Clarke, R. W.	Mr. Hutton, T. A. T.	Mr. Newsome, A.C.
Mr. Crapp, A.	Mr. Johns, A.	Mr. Watchorn, F. W.
Mr. Dollar, J. A. W.	Mr. Johns, C. A.	Mr. Wilson, W. T.

PROSECTORS.

Mr. Bates, J. H.	Mr. King, W.

VETERINARY ASSISTANTS.

Royal Agricultural Society, Norwich, 1886.

Mr. Wilson, W. T.	Mr. Maccormack, H. A.

Smithfield Club Show, 1886.

Mr. Hutton, T. A. T.	Mr. Dollar, J. A. W.

Professor BROWN: Gentlemen,—If we were assembled round a festive board it would be my pleasant duty to ask you to drink a toast (laughter), but as we are engaged in the more serious business of inaugurating a session of what will, I hope, prove to be hard work, I must take the more official, but

to me no less pleasant, course of asking you to accord a vote of thanks to the noble earl who has taken the chair on this occasion. It has been my good fortune, gentlemen, several times during the last twenty years to be associated with Earl Spencer in his official capacity as Lord President of the Privy Council; and I do not hesitate for one moment to assert that no one more than Lord Spencer has exhibited more anxiety to further in every possible way the interests of the veterinary profession. I have had the pleasure of hearing him speak frequently to some of the members of that profession who are his personal friends, and I know that, whenever an opportunity has offered itself of legislating for the benefit of its members, the noble earl has never failed to take advantage of that occasion. Gentlemen, without hesitation and with the certainty that my request will be acceded to, I ask you to carry by acclamation a vote of thanks to the chairman of to-day.

The CHAIRMAN: First of all let me thank my friend and late colleague, Professor Brown, for the very kind way in which he has proposed this resolution to you; next I must thank you too for the welcome you have given me to the Veterinary College to-day. I have listened with the deepest interest to the able address which was given to us at the opening of your session. I have said a few words with regard to what I thought of that address. I believe some people are fond of saying they ought always to rise from their meal with a good appetite that will ensure them a good digestion. Well, the only thing I felt when the professor sat down was that I regretted extremely he had not continued his address a little while, for I was feeling the deepest possible interest in all he said. I sincerely wished he could have continued his remarks a little longer. Gentlemen, I cannot come before you with any claim for any scientific knowledge on the noble profession which you are about to enter. I have no such knowledge. But as Professor Brown said, I have been more or less connected intimately during a great many years with your profession, and I feel the deepest interest in it. If I may say so, there are two schools in this country which have to do with diseases: there is the legislative school to which I belong, and there is the school of the healing art of veterinary science to which you belong. Now, I believe that in this country, not only with regard to diseases of animals, but with regard to human diseases, a great deal has been done by the Legislature. It controls, to a certain extent, the education given in all medical science, and it regulates the diplomas which are held by medical men. With regard to human diseases, it interferes in such matters as enforcing vaccination, in enforcing regulations for quarantine, and in regulating drainage and sanitary matters of various sorts. But with regard to animals it goes a great deal further, for it enforces directly, and, if I may use a sporting phrase, it "poaches" on the ground of medical veterinary science. It takes possession bodily of the patients which might come under your care. Now, I for one will not for a moment say that legislative interference with diseases of animals can be stopped. The Legislature has very important duties to perform. It does them, not because, I presume, it distrusts the veterinary profession, but because it cannot afford to give time to the veterinary profession to try their skill on the valuable animals which may come under their care. It cannot afford to allow diseased animals to remain in the country. If it did that, it would give a greater opportunity for students of veterinary science to practice their art. If diseased animals were allowed to be brought into the country, the loss to the country would be very great. The Legislature, therefore, enforces the most summary and compulsory slaughter, particularly if they are foreign animals, and the strictest isolation when the disease exists in the country, by means of infected areas and places. I believe I may claim, without detracting from veterinary science, for this class of legislation great success during the last few years. Disease in this country among animals has greatly and enormously

diminished. No doubt veterinary science has had its share in this, but legislation, I think, has had a still greater share. While saying this, I will not for a moment detract from the profession which you are about to follow. I would like to see your profession take the place of and drive out of the field the Legislature, if it were possible. Perhaps some day it may be possible. I do not think it is possible yet; but I am afraid the legislative school does hinder the development of veterinary science in this country to a great extent. I should prefer to see science and learning take the place of the pole-axe, but I do not think we shall see that for many a day. At the same time you have a great field before you. I believe that the 95,000,000 of animals in this country offer an enormous field for your profession. We have heard the history of this College from the learned professor in his admirable address, and I think we may well be proud of what the Veterinary College has done.

Now, in former years there was great ignorance with regard to this art, but modern society does not tolerate ignorance in any art in teaching medical or surgical practice, and it will not tolerate it any longer in veterinary practice. (Cheers). Now, you have, as I said, a very noble profession before you; you have an immense field before you. I am sure you will be able to utilise the admirable opportunities which are given at this College by the learned professors who teach you. What you have to do is, not only to alleviate the sufferings of the dumb creatures which are given to the care and companionship of man, but you also have to husband and increase the material wealth of the country by making healthier and sounder the animals which form so large a part of the riches of the United Kingdom. (Cheers). That is your duty. I am sure you will enter into it with earnestness, energy, and ability. Here in London, for nearly a hundred years, you have had this institution, which not only has benefited veterinary science, but also the sister science of medicine and surgery. No more appropriate or able remarks were made in the address that we heard than those which implied the intimate connection between the two sister sciences. Now, as Professor Brown has told me, there are considerable differences in the proficiency of your profession with regard to particular diseases. You are more skilful in diseases connected with horses, and less skilful in diseases connected with cattle, sheep, and swine. It is not very difficult to imagine or find the cause of that. Horses are of enormous value in this country, but their utility only lasts as long as they are healthy and sound. Every inducement therefore is held out to men to study the diseases of horses, in order to bring them back to soundness and health when they are lame or sick. There is not the same facility with regard to cattle, sheep, and swine. There is such immense value connected with these that very often those who have animals falling sick cannot afford to treat them long, or keep them in order to see whether they are going to fall sick. They are obliged to turn their carcases into money. They cannot afford to wait until remedies may be tried to cure them. This, I believe, accounts for the fact that most of the animals sent here for you to experiment upon are horses. This, I think, it will be very desirable to find some remedy for. There is a great opening for veterinary science with regard to the diseases of cattle. We will not take the Cattle Plague, which is such a terrible disease, but we will take merely a minor disease which does not often end in death—the Foot-and-mouth disease. No disease has caused greater loss in this country than that disease. You may imagine what is the loss to a farmer when the disease comes to a flock of ewes about lambing time, or to a grazier of fat cattle about to send to market. There is great inconvenience and loss through the sanitary regulations with regard to infected areas and places which the Legislature imposes on the district where the disease exists. Think what a benefit would accrue if you could find some

preventive like Jenner found for Small-pox, or some medicine which would overcome the losses incurred by this terrible disease. You would be conferring enormous benefit on the country, and diminishing losses which are continually coming upon the farmer. This is one of the objects you will have to study. You will have, as I have said, a noble profession before you—one worthy of men of the greatest ability and perseverance in the country. I sincerely trust that all those I see before me will go into their profession with that zeal and energy which it deserves, and I am quite sure you will be able to fulfil duties of a very high kind in your country, increasing not only the reputation of your country in the world, but the wealth and prosperity of England, if you succeed in your profession. I thank you, gentlemen, very sincerely for for the kind way in which you have received me here to-day.

The proceedings then terminated.

THE DICK VETERINARY COLLEGE.

THE Royal (Dick's) Veterinary College was opened on October 5th for the winter session by Lord Provost Clark.

The LORD PROVOST, in opening the proceedings, said that sixty-five years ago Professor Dick, then a very young man, seeing the necessity of such a college, instituted the Edinburgh Veterinary College. Many of those present, not of the younger but of the older generation, remembered Professor Dick, and all of them knew the enormous energy of the man, his profound love for his profession, and his earnest desire that that profession should be advanced in every possible way. Professor Dick had a great many difficulties to overcome, but he overcame them, and to show his desire for the promotion of the veterinary science, he left by his will the whole of his property for the extension of new premises in the institution. Sixty-five years had elapsed since that time, and the records of veterinary science showed how fully the wishes of Professor Dick had been brought to pass. They were now about to make a new departure. They had in Dick's College perhaps the very best veterinary institution in the country. It was not only supplied with Professors than whom there were certainly none better in the country—but it had also every modern appliance that could advance veterinary science and so could produce a race of young men who should be incited not only by the knowledge they had obtained in the College, but by those humane principles which originally dictated the institution of veterinary colleges, and who would, he was sure, be useful in many different ways, not only throughout the country but throughout the world, in promoting a more kindly disposition towards those animals so closely associated with the human race. During the eight years after Professor Dick's death there were no less than three principals in the College, one after another, but since Principal Walley's appointment in 1871 everything had gone on in a very smooth manner, with the exception of the little conflict last year, which he was certain would very soon be forgotten. He was sure it was the desire of the professors and students of the College that all its proceedings and the behaviour of the students generally should be such as to commend them to the whole community. He had the very greatest confidence that the young men attending the College would show in the future, as they had done in the past, that they were actuated by a sincere desire to advance in their profession, and to conduct themselves in such a manner as to be a credit, not only to the profession, but to the city of Edinburgh. The year before Principal Walley was appointed there were only nine old students in the college, five of whom obtained the diploma from the Royal College of Veterinary Surgeons. Now that they had such a grand new building he was sure that veterinary science would advance in a much more rapid manner than ever it had done before.

Bailie CRANSTON, convener of the Committee of the Dick Trust, said Professor Dick's money had been of great benefit, and would be of greater benefit when his wishes were thoroughly realised, and the trustees were able to give more bursaries and greater encouragement to young men attending the College. When the expenses of the buildings were cleared there would be a balance for the advancement of science in the College. The professors and teachers were second to none, and it was to be expected that the College would turn out some clever fellows, who would put London and every other place in the shade.

Professor M'KENDRICK, Glasgow University (a former professor of the College), in the course of a few congratulatory remarks, said the time was past when there could be drawn any distinction between veterinary medicine and medicine as applied to human beings. They were really one and the same science, and he had no doubt that as veterinary science progressed, the intimacy between these two departments of professional work would become much closer than it had ever been. He believed there was still a great future for veterinary science in Great Britain. It was quickly, year by year, coming to the front, and its professors were taking their proper place amongst scientific men. He had no doubt that before many years were over veterinary science in general would be as highly specialised in this country as it was in France, Belgium, and Germany. The time had now come when, in this department of science, a young man should be willing to give himself unreservedly and wholly to the study of veterinary physiology. Veterinary colleges had depended quite long enough for the teaching of physiology upon the medical profession. In conclusion, Professor M'Kendrick urged the students to take a high view of their profession, to think of it as a calling in life in which they would be able to excercise the very kindest feelings of humanity, to think of it also as a walk in life in which they would be brought face to face with many of the problems of disease, and in which they would be able to contribute their share to the general advance of science. Those who were engaged more especially in the study of disease upon human beings now recognised veterinary surgeons as co-workers in the same great enterprise of the investigation and cure of disease.

Professor WALLEY, in the course of an address, sketched the progress which the College had made since his appointment, and said he would like to see a farm, and all connected with it, added to the College, so that students might get the benefit of seeing the animals in their natural condition. If possible, he would also like to see a residential instiution outside the city where students could be accommodated with board and lodging, and have healthy air and exercise. He also alluded to the efforts made to obtain a Government grant in aid of the veterinary profession, and said that although they had not succeeded in getting it, it might come yet, and Goverment might see that the veterinary profession was as deserving of Government aid as any other profession.

Dr. AITKEN proposed a vote of thanks to the Lord Provost for presiding, and the proceedings terminated.

THE NEW VETERINARY COLLEGE, EDINBURGH.

THE fifteenth session of the New Veterinary College, Leith Walk, Edinburgh, was begun on Oct. 5th. There was a large attendance of students. Mr. John Waddell, Belford Park, Edinburgh, occupied the chair, and was supported by a large number of ladies and gentlemen.

The CHAIRMAN, who was received with loud applause, said the duty which he had been called upon to perform was one which he undertook with peculiar

pleasure, as he entertained the highest respect for their Principal, and had the best interests of their College at heart. Although he was not himself a graduate in veterinary science, he had all his life had a great deal to do with horses and other animals. Being an extensive breeder of Clydesdale horses, he was naturally interested in veterinary science, and he might say that he was not a little indebted to their Principal in connection with his own stud in Edinburgh and elsewhere. He did not think it was necessary for him to say much, as he was sure they were impatient to hear the opening address by their friend Professor Lewis. It was his hope that they might have a most successful session, and he was glad to hear that the number of students, new and old, was beyond that of any former year—and he had no doubt whatever that in these commodious premises, and with the appliances at their command, they would, or at least ought to, make good and profitable advances. The science of which they were the students was a most useful one, and it depended upon themselves whether it should become more so in future. In concluding, he had to assure them that he most heartily wished the College, its Principal, the professors, and the students all success during the ensuing session.

Professor LEWIS was received amid loud and continued applause, and in the course of his address said the College was founded in October 1873 under circumstances that were decidedly the reverse of auspicious. But in spite of all difficulties its career had—through the indomitable determination and energy of the Principal—been one of uninterrupted success. During the first session 61 students were enrolled, while at the termination of last winter session 194 were on the regular register. Owing to the large increase in the number of students, the accommodation afforded at Gayfield Square became insufficient, and the new buildings, furnished with every requisite for the work of a Veterinary College, were opened in October 1883. The results of the work of the past session were quite up to the average. At the January examination 25 students presented themselves, and 14 passed. In April, 74 were examined, and 49 passed. In July, 37 passed out of 49, making a total for the year of 100 passes out of 148 examinations. In the competition for the fifty prizes open to all the colleges in the kingdom, the New College had been very successful this time, carrying off the first and second prizes. Mr. C. Clarkson won the first of £50, and Mr. Hazleton the second of £30. At the termination of the last session the Principal of the Scotch Veterinary Schools determined to institute an important alteration in the arrangement of the time for attendance at college. Up to that time the year had been divided into two sessions—summer and winter—the summer session consisting of one term of eight weeks, and the winter session being divided into two terms of eleven weeks each. According to the new arrangement the winter session would commence on the first week of October instead of the last, and would continue without intermission (excepting the Christmas vacation) until about the second week in May, the summer session and April vacation then being abolished. It was further intended that there should only be two examinations in the year—one in January and the other in spring—instead of three as at present. This would be an advantage to the students, as it would enable them to devote nearly five months of each year to seeing practice. The new alterations would enable the work to be continued from the commencement of the session up to the time of the examinations. Other changes were contemplated, and would be discussed at the next meeting of Council. Two of them he hoped to see carried into effect without delay. The first was in connection with the arrangement of the subjects of the first and second examinations, and the second dealt with the order of the practical and oral portions of the final examinations. By the present arrangement about eight weeks more time was devoted to the study of

three comparatively unimportant subjects of the A examinations than was allowed for the preparation of the essentially important subjects for the B. It was not a good arrangement that students should be taught what drugs were used in the treatment of different diseases before they had an opportunity of learning anything about these diseases—even their names. The suggested alteration, if effected, would be a decided improvement. At the final examination, according to the present arrangement, the practical preceded the oral examination. The alteration suggested was that the oral should be held before the practical. If the student succeeded at the oral, but was rejected at the practical, he would not be required to present himselt again, and it would be optional for him to study his practical subjects either at college or under the supervision of some suitable member of the profession. This alteration had been recommended for a long time, but it had always been met with great opposition. During the past few years the most horrible and detestable disease known as Rabies had been exciting the attention of scientists and the public in general in a most forcible and painful manner. Almost daily fresh cases were reported, and in some districts the frequency of its occurrence had given rise to feelings of the greatest alarm. This was not to be wondered at considering the agonizing and terribly fatal nature of the disease. It was more a matter of astonishment that the country, and more particularly the governing powers, should have allowed a preventable disease of such a nature to become general in the country for so many years without making any serious effort for effecting its extermination or prevention. What was required was the adoption and vigorous exercise of those thoroughgoing measures for stamping out the disease which had been so frequently recommended by the best authorities —measures which had been found to be of the greatest value when properly carried out. It being admitted that the disease was propagated by contagion only, it naturally followed that its extermination should be much more easily effected than in cases where disease was spread principally by infection. That suppressive measures could be carried out satisfactorily was proved by the experience of Berlin and Bavaria. Effective measures of extermination having been adopted and carried out, the result was that they were now practically free from rabies, only three deaths having occurred during the last seven years. He then related what the principal measures adopted were. According to the report of the House of Lords on Rabies, the adoption of preventive measures in Berlin had been most successful, and the disease had been completely stamped out, no case having been reported since 1883. In 1853 a severe outbreak occurred, and seventeen mad dogs were destroyed. In consequence of this the muzzling operations were put in force, and special provisions were employed to destroy all dogs found in the streets without muzzles, the owners of such dogs being liable to a fine of 30s., or even to imprisonment. In the Netherlands also suppressive measures had been carried out most successfully. The report on Rabies, already referred to, finished up with the following recommendations:—(1.) "That when Rabies is present the muzzle should be enforced. (2.) That the power of the police constable should be extended to authorise the slaughter of stray dogs. (3.) That the symptoms of Rabies should be endorsed on dog licenses. (4.) That local authorities should have power to order that dogs should wear badges which might identify their owners. (5.) That in populous places local authorities should place restrictions upon dogs generally, and especially deal stringently with dogs in their district. (6.) That in the event of its being conclusively proved that M. Pasteur's system provides a preventive remedy, facilities should be afforded for its application in England." These recommendations, he said, comprised nearly all the most valuable measures which had been suggested for the suppression of Rabies,

and if adopted and efficiently carried out would, in all probability, be attended by the rapid disappearance of the disease.

Mr. GREAVES, T.S., Manchester, in proposing a vote of thanks to Professor Lewis, expressed his agreement with his remarks regarding M. Pasteur's system. As a member of the Council of the Royal College of Veterinary Surgeons, he had pleasure in informing them that a letter from Principal Williams and the other principals of the Scottish Colleges had been before them on Monday, and had been fairly and fully considered. They had agreed to the request that there should be two examiners at each table, and that there should be only two examinations instead of three. They had not, however, been able to accede to the application for giving the oral examination precedence of the practical.

Principal WILLIAMS, in proposing a vote of thanks to Mr. Waddell for presiding, said he hoped the Council of the Royal College would yet see the utility of the proposal of the Scottish Colleges making the oral examination precede the practical. It was an essential reform, and he would fight hard for it. Referring to Pasteur's experiments, he said he was positive that in the end it would be found that in Pasteur's discovery we had one of the greatest blessings that had been conferred on mankind. They could not expect success in every case, but it lessened the mortality, and even when it failed in saving life it greatly mitigated the sufferings of the patient. Speaking of the spread of Pleuro-pneumonia, he said it would never be cured by legislation. In Scotland they knew as a fact that they could deal with Pleuro-pneumonia by inoculation. Their opponents might say there was more Pleuro-pneumonia in Scotland just now than elsewhere. That was true, but we would have had ten times more if there had not been inoculation. Had inoculation not been in force in Mid-Lothian the loss from the disease in the county would not have been merely £1,000, but £10,000.

The CHAIRMAN replied, and the proceedings were brought to a close.

MONTREAL VETERINARY COLLEGE.

THE opening lecture of the winter session of the Montreal Veterinary Medical College was delivered by Professor D. McEachran, F.R.C.V.S., in the lecture-room of the college, on October 4th, the subject being "Veterinary Science, and Diseases of Animals in Relation to the Public Health." The Dean of the Medical Faculty of McGill University, Dr. R. P. Howard, occupied the chair, and there was a large attendance.

Dr. MCEACHRAN, in opening, expressed a hope that those who had attended previous sessions came back with renewed vigour and with a fuller conception of the necessity for an utility for their studies. To those who came up for the first time he would say, Do not be discouraged by the technicality of the elementary lectures, but adopt at the outset the motto, "Persevere and succeed." They were expected to devote their whole time and undivided attention to their work, and he was glad to say that as earnest workers and successful ones, too, the veterinary students ranked well with any students of the university. He urged them to be kind and fair in all their dealings with one another, and to be always respectful to their teachers, whether present or absent. He quoted from John Ruskin to show that their teachers knew best what they required to learn, and what they were capable of learning, and continued: "For your own encouragement I would merely say that such has been the progress of this profession, that a hundred years ago it was still a rude art, having scarcely more than emerged from the degradation which it was allowed to lapse into during the dark ages; to-day it ranks as one of the most important branches of medical science, having a scientific, as well as a commercial, importance secured to no other profession.

True it is that pecuniary emoluments and titled honours do not so often fall to our lot as in the sister profession, yet when I tell you that another of your fellow-students, Mr. Rowat, has been sent to practice and fill a Government position in the Sandwich Islands, with a guaranteed income of about 8,000 dols. a year, and several others are doing nearly as well, and that Her Majesty has been pleased to confer the honour of knighthood on the president elect of the Royal College of Veterinary Surgeons. Mr. H. L. Simpson, F.R.C.V.S., and the honour of C.B. on Principal Veterinary Surgeon George Fleming and Professor Brown, chief of the Veterinary Department of the Privy Council—and this is in a country which has so far allowed this profession to sink or swim without State aid—we have every reason to be proud of the position which we now occupy, and such distinctions should stimulate everyone of us to raise the stand of our education, and aim at being worthy members of a worthy profession. And never forget that a profession can never make a man, but a man can elevate or degrade a profession." Proceeding to deal with the question of "Veterinary Sanitary Science," Dr. McEachran said the importance of this subject was daily being more and more understood, and when people knew and realised the sad havoc constantly being caused in communities and families by diseases, dependent in many cases directly, and in others indirectly, on the communication of disease from animals to men, they would not rest satisfied till the present deplorable unsanitary condition of most of our towns and cities in this relation was remedied. As the compass of his address would not permit him to enter minutely into the details of investigations and experiments—these would be more fully gone into later—he must ask them to accept the statements about to be made as deductions from the scientific works of those whose special duties and opportunities have been confirmed and endorsed by the most eminent co-labourers. The diseases which we find most frequently communicated from animal to man, through an unsanitary condition, are, in the order of their importance, as follows:—1. Tuberculosis (Consumption); 2. Typhoid Fever, Scarlet Fever, Glanders, Entozoa, especially Tapeworm and Trichinæ, Parasitic Diseases, Ringworm, Itch, Septicæmia (Blood-poisoning), Variola and Vaccinia (Pox), Rabies or Hydrophobia. The communicability of Tuberculosis from animal to man has been proved beyond a doubt. How many a fond mother has fed her child on milk supplied by a tuberculous cow, resulting in the infant's untimely death, and often being the origin of Tuberculosis in many a young man or woman. The insidiousness of this disease makes it difficult to arouse the people to its danger. The milk-supply is often tested by public analysts and police inspectors to prevent its adulteration by water, but no effort is made to prove the absence of diseased germs in the nutrient fluid which forms the chief diet of infants and invalids. He was aware that this disease was on the increase among cattle in Canada as elsewhere, and the importance of fathers and mothers making sure beyond doubt that the animals supplying milk for their dear little ones were free from all taint of it, could not be over-estimated. As a rule, milk-consumers, in the absence of scientific inspection, would act wisely in refusing to use milk from a cow with a cough particularly of a chronic character. Wherever the inspection of animals at the slaughtering places is not thoroughly carried out by competent persons, both in the living animal immediately before slaughtering, and the carcase and internal organs at the time of killing, a percentage of tuberculous cattle is to be met with which would arouse the most apathetic were it to be known.

Typhoid Fever.—Regarding Typhoid Fever, he said there was no room for doubt but that in many instances this disease was carried about by the milk-can, several outbreaks of Typhoid Fever in schools and hospitals having been traced to the farm or dairy, where the existence of a case of this disease

explained its extension to customers supplied by the dairyman. Hence it is necessary not only that the cattle supplying the milk be free from disease, but that there be no possibility of disease germs—Typhoid or Scarlet Fever paticularly—having access to the milk, or milk-pans, or water with which it is diluted, This can only be done by inspection of the dairy and all its surroundings. Milk is the chief diet of the invalid, and specially of the Typhoid patient. Hence too much care cannot be exercised to guard against its absorptive powers. For this purpose, milk for the use of Typhoid patients should be bottled, kept close corked and at a low temperature, and not, as is too often done, obtained in quantity and kept in the sick room in an open jug or basin, constantly absorbing the germs of disease emanating from the patient, thus again to re-enter his system. He referred to the fact that, while Typhoid is known to prevail where imperfect drainage exists, and sewer gases are usually considered to be the cause of it, strange to say the disease prevails where most attention has been paid to sanitary matters, and proceeded to consider the prevalent belief that gas escaping from stables and from animals' excreta were injurious. The excreta of animals which live on purely vegetable diet, or even decayed vegetable matters, did not support those forms of animal life usually forming bacteria or micro-organisms usually found in most diseases. It was from decayed animal substances and the excreta of animals or persons fed on animal food that we find the most danger. On the other hand, many instances of restored health can be found from the almost constant companionship with horses and cattle in the stable and out of it. He alluded to the pestilential odours which were often caused through domestic pets, and which, on many occasions, when disease resulted, caused a cry of bad drains to be raised. Those pests, the rats, which he described as an indirect precursor of disease, often made direct communication with the drains, and caused air or sewer passages by which an entire house was enveloped in an atmosphere of sewer-gas, which seemed to come and go with changes of wind and weather. Besides this, there were the emanations from the excreta and decomposing carcases. Typhoid Fever prevails always after a dry season, especially when it is follow by a sudden and copious rainfall, because insufficient water is not pressed into the drains to carry off the solid or semi-solid mass which accumalates in them. With the flushing of the rain, the sewer-gas, charged with diseased germs, rushed through the open drains and rat-holes into our houses, the heated condition of the air in which induces this gas-current with which we are all familiar when we pull the plug out of a fixed wash-basin, somewhat modified and purified by the water in the trap, and better still when a defective point of leak in the soil-pipe allows it to escape free in an apartment.

How is this to be prevented ? The proprieter of the house should remove all lead and earthenware soil pipes from within the houses, use only solid and large iron pipes, see that the pipe runs either into a chimney which is in use, or else several feet above the roof. He should see to it that all the joints are gas-tight, and all connection provided with the best kind of traps. Abolish the wash-basin from the bedrooms, bathrooms, closets; and wash-basins should have no direct communication with the sleeping or living room, and should have direct light and ventilation, not borrowed, as is too often the case. To prevent accumulations, the drains should be flushed by a full stream of water being run through them for several hours at least twice a week Better by far increase the water-rate by a trifle per annum than allow the present unsanitary condition of our fair city to continue. Householders should be compelled to turn on their taps and let them run for, say, three hours simultaneously at least twice a week, or else the highest hydrants should be opened by the Corporation men. In addition to this, provision should be made for the special flooding of main tunnels, especially Craig-street. And

here a very simple plan, at comparatively little cost, is within our reach. Discussing this subject recently with a well-known contractor—Mr. L. J. Mallette, of Ottawa and St. Ann's—he suggested the tapping of the Lachine Canal above Cantin's shipyard, and every Sunday at least turning on a full current to wash out the tunnel and remove the sedimentary filth which here must be great. This suggestion is worthy the consideration of the Board of Health as a cheap and effective means of improving the sanitary condition of a very large and populous portion of the city.

Scarlet Fever.—This disease is also carried about by the milk-can, and has been traced in many instances to milk supplied by dairymen in whose families the disease existed. Hence the importance of care being taken that milk supplied by public dairies be not exposed to Scarlatina infection. Recent investigations go to prove that disease, similar in all respects to Scarlatina of the human subject, is met with in dairy cows, and of such importance has the subject been considered that the Veterinary Department of the Privy Council in England have been asked to investigate and report. This subject has frequently been urged by both the medical and veterinary professions in this country for years, yet, strange to say, not even the sad and awful experiences of the Small-pox plague, which cost us thousands of our population and millions of lost and diverted trade, has awakened the populace to the outrageous—nay, criminal—neglect of our Corporation in making provision for the prevention of these deadly but preventable diseases by a proper system of expert inspection and operative enactments, which will give power for carrying out wise and effective sanitary measures, of which inspection of dairies is not the least. Dr. McEachran also alluded to many other diseases which were capable of communication to man, such as Glanders in horses, Entozoa in beef and pork, especially Tape-worms, Septicæmia, or Blood-poisoning, and Rabies or Hydrophobia. In reference to the latter, he said considerable interest had been attached to Rabies, or Hydrophobia of late years through its prevalence in Europe, and the success which has attended the scientific experiments with cultivated virus conducted by the great bacteriologist, Pasteur. He quoted from the report of the committee of the English Local Government Board to show that the inoculations practised by Pasteur on persons bitten by rabid animals had prevented the occurrence of Hydrophobia in a large proportion of those who, if they had not been so inoculated, would have died of that disease, and that the value of his discovery was considered very great indeed.

The CHAIRMAN, at the conclusion of Dr. McEachran's lecture, referred to the gratifying fact that the veterinary and medical professions were working hand in hand, and endorsed all the doctor had said with reference to the communicability of certain diseases from animal to man.

Obituary.

The death is announced of Mr. Joseph Leather, M.R.C.V.S., in his sixty-seventh year, the melancholy event taking place at his residence, Melrose House, Springfield, Everton, near Liverpool, on September 28th. Mr. Leather, who graduated in 1862, was much esteemed by a large circle of friends, and was one of a family which included at one time several members of the profession.

The following deaths are also reported:—John Arnold, M.R.C.V.S., Thrapstone, Northampton, who graduated in 1846; Richard Hudson, M.R.C.V.S., Retford, Notts, a graduate of 1872; and Francis Thomas, M.R.C.V.S., Earl Shifnal, Salop, who graduated in 1870.

Notes and News.

A WARNING TO VETERINARY SURGEONS.—Joseph McCauley, a veterinary surgeon, Carlisle, who only graduated this year, was charged at Haltwhistle Police Court, on Sept. 29th, with aiding and abetting George Tweddle, Wydon Eals, Haltwhistle, to unlawfully remove twenty-three heifers from Carlisle into the county of Northumberland, on Sept. 19th, by issuing a license, not being a duly appointed inspector authorised to sign and issue such licences. Mr. S. Sanderson, Clerk of the Peace for Northumberland, prosecuted, and Mr. T. Johnson, solicitor, Carlisle, defended.—Mr. Sanderson stated that Mr. McCauley had been in the habit of signing certificates for the removal of cattle from Carlisle into Northumberland, although not an appointed inspector, and he had twice called Mr. McCauley's attention to the fact, but his letters were disregarded, and Mr. McCauley continued to sign the certificates. No one had to sign these licences unless they were properly appointed, which Mr. McCauley was not, consequently he had no right to do so.—George Tweddle gave evidence to the effect that on September 19th Mr. McCauley signed the document, and witness paid him 5s.—For the defence, Mr. Johnson stated that what Mr. McCauley had done was not unlawful. He merely signed the certificate, but did not remove the cattle. He (Mr. Johnson) contended that it was merely an indiscretion on the part of his client. —The Bench inflicted a fine of £10 and costs. Other two cases against Mr. McCauley were withdrawn.

GRAND VETERINARY COUNCIL OF FRANCE.—The association of French Veterinary Surgeons designated by this title, which has just met at Bordeaux, expressed an opinion that the inspection of meat ought to be very much more real than it has been. A vote was also unanimously passed expressing the view of the association that veterinarians ought to be admitted as members of the National and Departmental Sanitary Councils. A vote passed last year at the meeting held at Lille, to the effect that one of the diplomas of Bachelor of Letters or Bachelor of Sciences ought to be compulsory for veterinary students, was confirmed.

MEAT INSPECTION IN BERLIN.—At the Berlin meat examination station during the month of August there were examined 7,945 calves, 11,788 sheep, 7,216 pigs, and 8,265 quarters of beef. Of these were condemned 17 pigs (including one from trichinæ, 8 from measles, and 4 from tuberculosis); also 3 calves and 9 sheep; 24 of the beef quarters, 8 of which were affected with tuberculosis, and 8 from jaundice; 62 lungs and livers were also condemned.

THE ALFORT VETERINARY SCHOOL.—Some marked changes have taken place in the staff of this celebrated school. The director, M. Goubaux, has retired after forty-six years' zealous service, latterly as Professor of Sanitary Police and Jurisprudence. The French Government, to mark its sense of the able manner in which he has discharged his duties for this very long period, have accorded him the distinction of Honorary Director. He is succeeded in the important office by M. Nocard, Professor of Surgical Pathology and Clinic, who, although young, has won golden opinions for his scientific knowledge and work, no less than for his administrative tact. He passes over Professors Jolin and Trasbot, who are much senior to him as members of the teaching staff. M. Saunier, Professor of Physics and Chemistry, also retires, after a service of thirty-two years.

RABIES IN DEER.—A year ago the deer in Richmond Park, near London, were seen to be suffering from some strange disorder. Several of them died; but it was not until January, 1887, that the disease was proved to be Rabies. Since then the keepers have been doing their best to stamp out the infection, but with little success. For a while there are no fresh cases; then several

animals are found to be infected at the same time, and have to be destroyed. At least 150 fallow-deer have already been killed, though the red deer seem so far to have escaped the contagion. When the disease was pronounced to be Rabies, the keepers were somewhat incredulous; but to any one well acquainted with the symptoms the condition of the poor animals which were netted and brought for inspection could not be matter for doubt. Even when the fact was proved by experiment, it was difficult to understand how the infection was communicated. Deer, it was said, do not bite when fighting, but use their horns. It was observed, however, that the rabid deer did bite others, inflicting very severe wounds; for though the stag has only a pad of bone in the upper jaw, the lower is armed with from four to eight very sharp incisors. They are also fond of licking each other, and it was found that the saliva of an infected deer was fatal to a dog: a healthy doe after being bitten by it also died rabid. It was hoped that the further spread might be checked by isolating the animals infected: a plan which was rendered less difficult than might be supposed by a habit which the deer have, after the breeding-season, of dividing into separate herds into which intruders are not admitted. As the disease was apparently confined to a single herd, it seemed probable that by separating this from the others the disease might be kept within bounds. On the north side of the park near the head keeper's lodge is an old enclosure, which was enlarged, and the herd were then decoyed into it by food placed inside. This was not difficult, as during the winter months the deer are always fed with hay, maize, and swede turnips, and the heavy snow made them tamer than usual. The ground was well suited for keeping them in health, as it is on a hill, with a good supply of water, and dotted with large trees and patches of bracken for shelter. In July about thirty stags and fifty hinds were left in the enclosure; the stags keeping in a separate herd and lying quiet, as their horns were in the velvet, when they are very tender. But, though apparently healthy, several stags had been shot the day before my visit, and had no doubt left the seeds of further mischief behind them. Since then nearly all those first confined have been destroyed, and now another herd is enclosed as suspect. But this is not the whole extent of the mischief. Isolated cases have appeared in the park; and if these increase it will be difficult to know what further precautions can be taken, for the season is at hand when the old herds are broken up and the stags join the hinds for some time. Though so many have been lost there are still more than 1,200 deer left in the park, both red and fallow, and few parks contain a larger stock in proportion to their size. It was once supposed that the two species could not be kept together, and in some places, as at Grimsthorpe and Badminton, they are still separated. But at Richmond they live together peacefully enough, and I have seen the red and fallow stags feeding in the same herd. The fallow are true woodland deer, and their colour exactly matches that of the dead bracken; the red deer prefer the more open ground. At present, though the stags have not joined the hinds, many have left the company of their own sex and are lying quietly by themselves in the fern. In July the fawns are born, when the bracken is highest and the mothers can best conceal them. The fawns of the red deer are spotted like the fallow. Though the red deer of Richmond do not reach the great size of those in Windsor Forest, many of them are above the average of those in a Scotch forest.

RABIES.—At a recent meeting of the Royal Society, Mr. Victor Horsley communicated a paper by Mr. G. F. Dowdeswell, M.A., on Rabies, of which the following is an extract:—In this investigation conducted in the laboratory of the Brown Institution, commenced early in 1885, during the outbreak of Rabies in London, the first experiments, made by subcutaneous inoculations with the saliva of rabid street-dogs, all failed to produce infection. Subse-

quently, adopting the methods described by M. Pasteur, Mr. Dowdeswell found.—1, That the virus of Rabies and Hydrophobia resides in the cerebro-spinal substance, and in the peripheral nerves, and is not confined to the salivary glands, as hitherto supposed. 2. That by inoculation of this substance upon the brain of another animal by trephining, infection follows much more quickly and certainly than by subcutaneous inoculation. 3. That Rabies, however produced, in both dogs and rabbits, is essentially a paralytic affection, the same disease in both animals, and that there is no constant distinction between the so-termed "dumb" and "furious" Rabies. 4. That the initial virulence of street Rabies is usually increased, and becomes remarkably constant, by passing through a series of rabbits. 5. That the activity of the virus is shown by the duration of the incubation period, to which it is inversely proportionate. 6. That the tissues of an infected animal do not themselves become infective till towards the end of the incubation period. 7. That of a large number of drugs that were tried, both germicides and those acting specifically upon the cerebro-spinal system, none materially modify the action of the virus in the rabbit. 8. That by a series of subcutaneous inoculations with virus treated by the methods of M. Pasteur, immunity, even against subsequent infection, cannot be conferred upon the rabbit; and that the extreme and unexpected constitutional refractoriness of the dog to infection with Rabies by any method of inoculation—as the author found it in the limited number of experiments he had been able to perform with this animal—renders it extremely difficult to determine the effect of such remedial or prophylactic measures in it; and that it is by the statistics of the treatment alone that their effect with man can be decided; but that, judging from the results of the experiments of others, the principle of the method as affirmed by M. Pasteur appears to be established, though unquestionably the "rapid" or "intensive" treatment, as Mr. Dowdeswell had found, is liable to produce infection.

Correspondence.

EQUINE SYPHILIS.

DEAR SIR,—On page 161 of the current number of the VETERINARY JOURNAL, I note, with interest, an editorial concerning the outbreak of "Maladie du Coït" in Illinois.

The centre of the infected area is about twenty miles distant from me, and is in a portion of the territory over which my practice extends, and in my capacity as Assistant State Veterinarian, it has fallen to my lot to be the first to report the matter. I have conducted almost all the investigations alone, and have just made a general report upon the malady, its extent, etc., to the State Board of Live Stock Commissioners of Illinois.

The reported nine stallions kept in Bloomington under treatment were really only one-third that number, the error having been due to careless reporters; and the animals were in my charge.

Being situated, as I am, in one of the most important draught-horse breeding centres in the United States, and this malady breaking out in my immediate neighbourhood, as well as my official connection with the outbreak, leads me to take a deep interest in the disease, and gives me a strong desire to learn all I can concerning it.

I have learned much from your very excellent article upon the disease in your Veterinary Sanitary Science and Police, but you refer in your editorial to interesting publications by the Austro-Hungarian Government of a more recent date.

Would you be so kind as to inform me where and how I can obtain these

publications? If they can be had in England, and you will kindly hand this letter to a bookseller who will send them to me with charges, I will at once remit; or if you can without trouble forward this letter or my address to parties on the Continent who can furnish me with them as above, I shall feel myself under great obligations to you.

My report just completed will, I presume, be published, and if you desire I shall gladly forward you a copy of the same, or will furnish you any facts in my power regarding this outbreak which you may desire.

Trusting you will kindly pardon my intrusion (as I know of no other means of obtaining the desired publications). W. L. WILLIAMS, V.S.

Bloomington, Illinois, U.S.A.

September 14th.

[The work we alluded to is by Dr. Ludwig v. Thanhoffer, Professor in the Budapest (Hungary) Veterinary School, and was published in that city in 1882. The title is "Uber Zuchtlähme; Nach Einigen Pathologisch-Histologischen Untersuchungen." The treatise has some excellent plates. The publishers of the VETERINARY JOURNAL will be requested to procure and forward it to our correspondent. We shall be very pleased to receive a copy of our correspondent's report.]

SIR,—Under the heading of "Equine Syphilis in the United States of America," in September's issue of your Journal, it was stated that the above-mentioned disease was known "to the Arabs as El Dourine." Believing that the term "Dourine" and "Maladie du Coït" are used synonymously by writers on "Syphilis of the Horse" in French works of veterinary medicine, I asked a Frenchman the English for the disease called in France "Dourine," and he immediately stated it to be "Syphilis of the Horse."

I further ventured to inquire of the native medical authorities as to the disease known amongst "the Arabs" as El Dourine, but was informed that such a malady in the Arabic was not known, and further, Dr. Rijky Bey undertook to search for the word in medical and other dictionaries, but could not find such a word as "El Dourine" in the language. Sub.-Vet. Insp. M. Saifout, who has studied and taken his diploma from the Veterinary School at Alfort, informs me that the Arabic term for the disease known in France as "Maladie du Coït" is "Morade el Guimah.'

Syphilis of man is known by the Arabs as "Jan bil Franki," that is to say, the "European disease." WILLIAM LITTLEWOOD, M.R.C.V.S.

Board of Health, Cairo, *Sept. 13th.*

VETERINARY EDUCATION.

SIR,—It comes without the saying that all of us are interested in professional progress; to be otherwise would be traitorous to our best interests. That we do not all think alike or pursue the same track is perfectly natural, and yet those most opposite may be equally sincere. As far as I can gather the sense of Mr. Harvey's letter, it is that graduates that have had no previous professional training are equally fitted to practice with those that have. On this point I am at direct issue with him. It is no question of those who work or those who are lazy; it is a question of opportunity, and I maintain that the facility for practical attainments is at schools restricted, if not in numbers, in range. If a youth enters a pupilage, and becomes a worker and a student, we may infer that the further he advances the keener his quest, and it is these that become the ornaments of the profession. Surely Mr. Harvey does not mean that the curriculum is sufficient to enable a student to thoroughly fit himself for practice. This is contradicted by the numerous advertisements in your pre-pages of recent graduates who willingly go for a small salary, some for

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none, *but who must see practice.* Something more is necessary for our clients, at all events, than gentlemanly address, good style in turn out and costume, and the ability to *explain* disease. By the last I mean empirically or by rule of thumb; *they* require the knowledge to distinguish, and also skill to treat it, both in its simple types and in its complications. These are not learnt at college, and if they have to be obtained *after* a man has commenced practice, it is at the expense of his clients' pockets and of his own reputation. Such a course is a sham and an imposition, and, candidly speaking, is within touch of the "Statute of Fraud." I was a pupil for some years before entering college; a student there, and am still one, and withal I find much to learn, but I do not profess to be a "heaven-born genius," or to have found "the royal road." The *faux pas* made by untrained graduates can be proved by many of us, and they are neither singular nor exceptional, or amongst the lazy or stupid ones, but amongst the more distinguished, that is, if honours count. The inuendo anent the "stable" is not in the best possible taste when we consider that to be a thorough practitioner a man must be well acquainted with every detail connected with it, and not in a kid glove manner either. More, it is affectation to despise what is a source of knowledge and also of profit, especially when there is nothing derogatory or degrading about it.

Your leading article of this month deals with the question in a very earnest and able manner, and I would recommend its perusal to Mr. Harvey and to all who value the honour of our profession. W. Cox, M.R.C.V.S.

October 10th.

We are requested to state that the next meeting of the Royal Counties Veterinary Medical Association will take place at the First Avenue Hotel, High Holborn, London, on November 26th, when the discussion on Professor Robertson's paper—Inoculation as a Preventive of Pleuro-pneumonia—will be resumed.

We will thank our correspondents, when they send newspapers, to mark the passages they wish us to notice.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from W. L. Williams, Bloomington, Illinois; J. A. Nunn, A.V.D., Maritzburg, South Africa; W. Littlewood, Cairo; Messrs. Arnold, London; H. C. Wilkie, Wolverhampton; F. Raymond, A.V.D., Woolwich; S. Wiltshire, Pietermaritzburg, South Africa; H. Kidd, Hungerford; J. Lambert, A.V.D., London; C. Cunningham, Slateford; S. Wilson, A.V.D., Aldershot; F. C. Mahon, Southsea; A. Leather, Liverpool; W. Penhale, Barnstaple; J. R. Green, Alfreton; W. Cox, Newcastle-on-Tyne.

BOOKS AND PAMPHLETS: *H. T. Lilley*, Bench Book for Test Tube Work in Chemistry; Report of the Minister of Agriculture for the Dominion of Canada; *R. W. Burke*, The Equine Diseases of India; *M. Laulaine*, Programme de Cours de Physiologie professé à l'Ecole de Toulouse; *M. Reuter*, Die Schweineseuche und deren Wirksame Bekämpfung; *J. Law*, The Farmer's Veterinary Adviser; *J. B. Buist*, Vaccinia and Variola; *G. A. Banham*, Tables of Veterinary Posology and Therapeutics; *H. W. and G. Gresswell*, How to play the Fiddle; Veterinary Reports on some Diseases of Stock found in Victoria; *A. L. Buonsanti*, L'Indirizzo e il Metodo nell' Insegnamento della Anatomia Veterinaria.

JOURNALS, ETC.: *Nebraska Farmer; Time; Journal of National Agricultural Society of Victoria; Echo Vétérinaire; American Live Stock Journal; Annales de Méd. Vétérinaire; Hufschmied; Recueil de Méd. Vétérinaire; Live Stock Journal; Thierarzt; Wochenschrift f. Thiermedicin und Thierheilkunde; Lancet; Journal de Méd. Vétérinaire; Edinburgh Medical Journal; Clinica Veterinaria; Mark Lane Express; London Medical Record*; *Annales de Méd. Vétérinaire; British Medical Journal.*

NEWSPAPERS: *Essex Newsman; Carlisle Journal; Scottish Leader; Daily Nebraska State Journal; Times of Natal; Montreal Gazette.*